



US EPA RECORDS CENTER REGION 5



HIMCO ANNUAL GROUNDWATER MONITORING REPORT

Prepared For:
Himco Site Trust

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to present the results of routine groundwater monitoring completed by Conestoga-Rovers & Associates (CRA), on behalf of the Performing Settling Defendants (PSDs) at the Himco Site, located in Elkhart, Indiana. Routine groundwater monitoring will be conducted quarterly for two years, at which time the results will be evaluated and the groundwater monitoring program will be rationalized.

The Himco Site is a National Priorities List (NPL) site that is being remediated pursuant to a Consent Decree (Civil Action No. 2:07cv304 (TS)) (CD). The Statement of Work (SOW), included as Appendix B of the CD, specified the Remedial Action requirements for the Site. The SOW requires groundwater investigations to the east and southeast of the Himco Site and the implementation of a Groundwater Monitoring Program. CRA, on behalf of the PSDs, prepared a Remedial Design Work Plan that combined the East and Southeast Groundwater Investigations and the Groundwater Monitoring Program into a three-phase Groundwater Investigation that builds incrementally to address the groundwater investigation and monitoring requirements of the SOW.

CRA completed the Phase I Groundwater Investigation in 2008 and 2009. The Phase I Groundwater Investigation consisted of:

- Historic data compilation
- Existing monitoring well reconnaissance and survey
- Baseline groundwater monitoring
- Phase I vertical aquifer sampling
- The Interim Groundwater Monitoring Program

CRA submitted the Phase I Groundwater Investigation Report to the United States Environmental Protection Agency (USEPA) in May 2009. The Phase I Groundwater Investigation included recommendations for the scope of the Phase II Groundwater Investigation. USEPA provided comments on the Phase I Groundwater Investigation Report in a letter dated August 12, 2009. CRA responded to these comments in a letter dated October 20, 2009 and USEPA approved the recommendations for the Phase II Groundwater Investigation in a letter dated December 23, 2009. The Himco Site Trust is implementing the Phase II Groundwater Investigation in 2010.

1.2 BACKGROUND

The Site is a closed, unlicensed landfill located at the intersection of County Road 10 and the John Weaver Parkway (formerly Nappanee Street Extension) in Cleveland Township, Elkhart County, Indiana. The Site is approximately 60 acres in size, and accepted waste such as household refuse, construction rubble, medical waste, and calcium sulfate between 1960 and 1976. The landfill was closed in 1976.

Figure 1.1 shows the Site location. Figure 1.2 shows the layout of the Site, including property boundaries.

The Site consists of two major areas: the landfill, which is covered with calcium sulfate and a layer of sand, and the 4-acre construction debris area (CDA), located on the northern portion of seven residential properties and one commercial property that front onto County Road 10.

The Site was proposed for the National Priorities List (NPL) in 1988 and was placed on the NPL in 1990. The Remedial Design/Remedial Action (RD/RA) is being conducted pursuant to the CD, which became effective on November 27, 2007. The lead Agency for the Site is the USEPA Region 5. The Indiana Department of Environmental Management (IDEM) is the support Agency.

Section II, Paragraph 4.3 of the SOW describes the requirements for the groundwater investigation east and southeast of the Site. The purpose of the investigation is to delineate the contaminant plume emanating from the Site that may potentially be impacting the adjacent aquifer and water supply wells. For the purposes of the groundwater investigation, the East and Southeast Groundwater Investigation and the Groundwater Monitoring Program were combined. Information regarding groundwater quality and groundwater flow directions from both areas will be combined to interpret local hydrogeologic conditions.

Section II, Paragraph 5 of the SOW describes the requirements for the Groundwater Monitoring Program intended to characterize the nature and extent of groundwater contamination beneath the Site. A network of 39 monitoring wells was described in the Supplemental Site Investigation/Site Characterization Report (USEPA, December 2002) (SSI).

Section II, Paragraph 5.1 of the SOW states that the PSDs "will submit a groundwater monitoring plan as part of the RD Work Plan, which will address the frequency of sampling, the wells to be sampled, and laboratory analyses to be performed". The SOW

also requires that the wells be segregated into wells for detection monitoring and wells for compliance monitoring. Paragraph 5.1.4 further states that all groundwater wells associated with the Site shall be monitored for 10 years, but that an alternate schedule may be used if approved by USEPA.

CRA used vertical aquifer sampling (VAS) techniques during the Phase I Groundwater Investigation to characterize the variations in contaminant distribution with depth in the thick sand aquifer sequence underlying the Site. CRA used VAS at the Site to address this data gap and to ensure that any new monitoring wells are installed to the appropriate depths.

CRA will complete the groundwater investigation at the Site in phases based on the portion of the Site being investigated and the target depths of the investigation. A phased approach permits information collected during the initial stages of the investigation to be used to guide subsequent phases of the investigation. The Phase I Groundwater Investigation included VAS at selected monitoring well locations to investigate the horizontal and vertical extent of groundwater contamination to a depth of approximately 150 feet below ground surface. CRA collected hydraulic monitoring data during the Phase I Groundwater Investigation to evaluate the groundwater flow regime in the vicinity of the Site and to guide future plume delineation. CRA completed groundwater sampling of the existing wells to characterize groundwater quality beneath the Site.

The objectives of the groundwater investigations are to:

- i) Delineate the horizontal and vertical extent of groundwater impact from the landfill around the perimeter of the landfill
- ii) Delineate the plume contaminating the residential well at 54305 Westwood Drive, immediately east of the Site
- iii) Delineate an appropriate buffer zone east of the Site
- iv) Delineate groundwater contaminants that may have migrated south of the Site
- v) Provide information required to design an appropriate monitoring well network

The Phase I Groundwater Investigation represents the first stage of data collection and analysis and consisted of the following tasks:

- Historic data compilation
- Monitoring well reconnaissance and survey

- Baseline groundwater sampling
- VAS

The Phase II Groundwater Investigation and any subsequent groundwater investigation will consist of the following tasks:

- Additional VAS, if required
- New monitoring well installation
- Groundwater quality monitoring

The Phase I Groundwater Investigation VAS was focused on the southeast portion of the landfill and downgradient areas, and was limited to 150 feet in depth. Phase II of the Groundwater Investigation will further refine the horizontal and vertical delineation of any plumes emanating from the Site, document background groundwater quality, and define appropriate locations and depths for sentry monitoring wells.

1.3 REPORT ORGANIZATION

This report is organized as follows:

- Section 2.0 describes routine groundwater monitoring activities completed at the Site
- Section 3.0 describes Site conceptual hydrogeologic model
- Section 4.0 discusses the results of the groundwater elevation monitoring
- Section 5.0 discusses groundwater quality
- Section 6.0 presents conclusions
- Section 7.0 presents references cited in this report

2.0 INVESTIGATIVE ACTIVITIES

2.1 INTRODUCTION

This section describes the scope of groundwater monitoring activities completed at the Site. Section 4.0 describes the results of groundwater elevation monitoring. Section 5.0 describes the results of groundwater quality monitoring.

2.2 GROUNDWATER ELEVATION MONITORING

CRA completed the initial round of groundwater elevation monitoring on October 27, 2008. CRA inventoried the existing monitoring well network prior to the water level round and Table 2.1 is a summary of the status of the monitoring wells in the vicinity of the Site.

CRA completed quarterly groundwater elevation monitoring rounds on:

- Q1 - October 27, 2008
- Q2 - February 9, 2009
- Q3 - April 28, 2009
- Q4 - August 3, 2009
- Q5 - November 2, 2009
- Q6 - February 24, 2010

Section 4.0 provides the results of the groundwater elevation monitoring.

2.3 GROUNDWATER QUALITY MONITORING

CRA completed a Baseline Groundwater Sampling round from October 28, 2008 through November 6, 2008 and on November 18 and 19, 2008. The purpose of this sampling was to determine if the wells are capable of providing representative groundwater samples and to establish baseline groundwater quality conditions. Baseline Groundwater Sampling round represents the first routine quarterly groundwater quality monitoring round (Q1).

CRA completed the initial round of the Interim Groundwater Monitoring Program in February 2009. The following are the dates of the Interim Monitoring Program sampling events CRA has completed at the Site to date:

- Interim Monitoring Program (Q2) - February 9 to February 19, 2009
- Interim Monitoring Program (Q3) - April 29 to May 6, 2009
- Interim Monitoring Program (Q4) - August 4 to August 18, 2009
- Interim Monitoring Program (Q5) - November 3 to November 11, 2009
- Interim Monitoring Program (Q6) - February 23 to March 4, 2010

The primary goal of the Interim Groundwater Monitoring Program is to characterize the nature and extent of groundwater contamination beneath the Site. The Interim Groundwater Monitoring Program will be completed on a quarterly basis for two years. The results of the Interim Groundwater Monitoring Program will be provided to the USEPA after two years (eight quarterly events) are completed, at which time the scope and frequency of any further groundwater monitoring will be proposed.

The monitoring wells included in the Baseline Groundwater Sampling round and Interim Groundwater Monitoring Program are shown on Figure 2.1 and listed in Table 2.2. The monitoring wells currently included in the Interim Groundwater Monitoring Program are the same as the Baseline Groundwater Sampling round with the exception of monitoring well WT116B, which was added to the Interim Groundwater Monitoring Program. The WTJ monitoring well nest (shown on Figure 1.2) was included in the Baseline Groundwater Sampling round and the Q1 2009 (February 2009) through the Q4 2009 (November 2009) Interim Groundwater Monitoring Program when USEPA agreed it was appropriate to discontinue groundwater quality monitoring at this location.

Table 2.3 provides the groundwater monitoring parameter list. The parameter list for the Interim Groundwater Monitoring Program is the same as the Baseline Groundwater Sampling round, with the exception of cyanide, which was added to the Interim Groundwater Monitoring Program. As additional monitoring wells are installed in the course of groundwater investigations they will be evaluated and incorporated into the Interim Groundwater Monitoring Program, if appropriate. The parameter list included Target Compound List (TCL) semi-volatile organic compounds (SVOCs), TCL volatile organic compounds (VOCs), Target Analyte List (TAL) metals and selected general chemistry parameters. TestAmerica Laboratories Inc. of North Canton, Ohio analyzed the groundwater samples in accordance with EPA Method Manuals as outlined in Appendix C, Table 2. Analytical results are compiled in Appendix B. Laboratory

reports and data validation memoranda are provided in Appendix C. CRA validated the groundwater analytical data in accordance with the Quality Assurance Project Plan (QAPP) included in the Remedial Design Work Plan (CRA, November 2008). Stabilization parameters measured during groundwater sampling are provided in Appendix D.

3.0 REGIONAL AND SITE GEOLOGY AND HYDROGEOLOGY

3.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

Elkhart County is located in the St. Joseph River Basin. A thick sequence of glacial outwash deposits, ranging from 85 to 500 feet, overlies the bedrock. In the vicinity of the Site, these overburden deposits consist primarily of outwash sands and gravels that contain both minor lenses of silt and clay and a regionally significant clay/silt dominated interval of variable thickness. The regional geologic units and the corresponding hydrogeologic units are, in descending order:

- The upper sand and gravel – the Regional Upper Aquifer
- The regional silt/clay layer – the Regional Semi-Confining Layer
- The lower sand and gravel – the Regional Lower Aquifer
- The unnamed clay layer – the Unnamed Clay Layer
- The bedrock – the Bedrock

Figure 3.1 provides a schematic cross section of the regional geologic and hydrogeologic units.

The upper sand and gravel corresponds to the Regional Upper Aquifer. It thickens to the south across Elkhart County. It is typically 50 feet thick and ranges up to 150 feet thick. Thin deposits of silt and clay are also present within the Regional Upper Aquifer.

The regional silt/clay layer forms a Regional Semi-Confining Layer that typically underlies the Upper Aquifer. It is a silt/clay dominated sequence with interbedded sands and gravel (Arihood, L.D. and Cohen, D.A., 1997). The Regional Semi-Confining Layer is not present beneath the Site, but south of the Site, it attains a maximum thickness of 175 feet.

The lower sand and gravel corresponds to the Regional Lower Aquifer and lies beneath the Regional Semi-Confining Layer. The Regional Lower Aquifer is composed of interbedded sand and gravel.

Another clay layer is present south of the Site between an elevation of 590 feet Above Mean Sea Level (AMSL) to 620 feet AMSL. As illustrated on Figure 3.1, south of the Site this "unnamed" clay layer lies directly on the bedrock and forms the base of the Lower Aquifer. This unnamed clay appears to be discontinuous beneath the Site because it is

encountered in deep wells located along the southern Site boundary but not along the northern Site Boundary.

The bedrock beneath northwest Elkhart County is the Devonian and Mississippian aged Ellsworth Shale. The Ellsworth Shale consists predominately of greenish-gray shale alternating with light greenish limestone and dolomite. The Bedrock is not a significant source of groundwater. The typical elevation of the bedrock surface in northeast Elkhart County is highly variable but is typically between 550 and 600 feet above mean sea level (AMSL). A bedrock valley has been delineated beneath the eastern portion of the Site. This north-south trending bedrock valley is incised to 350 feet AMSL.

The depth to water in the region of the Site varies from 8 to 17 feet (Duwelius and Silcox, 1991). Overburden groundwater in the area flows south towards the St. Joseph River, which is the regional discharge for this area. An average regional horizontal hydraulic gradient of 1.5×10^{-3} feet/feet was reported for the Elkhart area (Duwelius and Silcox, 1991). Vertical hydraulic gradients are small in areas away from the river.

Typical hydraulic conductivity calculated from pumping tests conducted in the vicinity of the Site ranges from 50 feet per day (feet/day) to 200 feet/day. Some of the large water supply wells in the area are capable of yielding in excess of 2,000 gallons per minute (gpm). The hydraulic conductivity in the vicinity of these wells is typically 500 to 1,500 feet/day. The lower end of this range of values is typical of clean sand and the higher end of the range is typical of gravel deposits. Duwelius and Silcox (1991) estimated the regional groundwater velocity was 1.1 to 1.7 feet/day.

Several municipal well fields serving the City of Elkhart are located near the Site. The closest is the North Main St. Well field located approximately 1.5 miles east-southeast of the Site. CRA searched the Indiana Department of Natural Resources Water Well Record Database as part of the Phase I Groundwater Investigation (CRA, May 2009). As of 2009, these records indicate 26 wells with a capacity greater than 70 gpm are present within 0.9 miles of the Site, mostly to the southeast. These wells have the potential to influence groundwater elevations and flow directions in the vicinity of the Site.

3.2 SITE GEOLOGY AND HYDROGEOLOGY

There are five principal stratigraphic units beneath the Site. They and the corresponding hydrostratigraphic units are, in descending order:

- The upper sand and gravel - the Upper Aquifer (710 feet AMSL to 760 feet AMSL)

- The intermediate sand and gravel with silt and clay layers - Intermediate Aquifer (710 feet AMSL to 610 feet AMSL)
- The Unnamed Silt/Clay Layer (590 feet AMSL to 610 feet AMSL)
- The lower sand and gravel - the Lower Aquifer (270 feet AMSL to 590 feet AMSL)
- The bedrock - the Bedrock

Figure 3.1 illustrates the differences between the typical regional hydrostratigraphic sequence and conditions beneath the Site. The geology and hydrogeology beneath the Site differs from the regional geology and hydrogeology because the Regional Semi-Confining Layer is not present in the overburden sequence beneath the Site. The regional hydrostratigraphic sequence typically consists of an unconfined Upper Aquifer and a semi-confined Lower Aquifer separated by the Regional Semi-Confining Layer. The Regional Semi-Confining Layer is absent beneath the Site and the regional Upper and Lower Aquifers coalesce.

CRA conceptualizes the Upper and Intermediate Aquifers beneath the Site as one aquifer with aquitard materials occasionally interspersed. The Intermediate Aquifer is generally finer-grained than the overlying Upper Aquifer and it contains discontinuous zones of silt and clay. The Intermediate Aquifer occupies the same interval as the regional Semi-Confining Layer and the regional Lower Aquifer, which both terminate at 610 feet AMSL. While the distinction between the Upper Aquifer and the Intermediate Aquifer beneath the Site is somewhat arbitrary, it is a useful distinction when discussing groundwater quality in the vicinity of the Site.

As described in the Phase I Groundwater Investigation Report (CRA, May 2009), many of the Phase I VAS boreholes terminated in a gray clayey silt or silty clay. Figure 3.1 shows the Unnamed Silt/Clay Layer beneath the Site. It is possible that the Unnamed Silt/Clay Layer behaves as a confining layer at the base of the Intermediate Aquifer. Alternatively, the Unnamed Silt/Clay Layer may be isolated lenses of silt and clay. CRA will investigate the thickness, extent and confining properties of this potential confining layer during the Phase II Groundwater Investigation.

The deep bedrock valley beneath the western portion of the Site also contrasts with typical regional hydrogeologic conditions. The regional overburden sequence is typically 200 to 250 feet thick. In the bedrock valley beneath the Site it is in excess of 450 feet thick. Furthermore, the base of the regional overburden sequence sand is the Unnamed Silt/Clay. Beneath the Site the sand and gravel sequence that underlies the Unnamed Silt/Clay is absent from the regional hydrostratigraphic sequence. The Regional Lower Aquifer corresponds to the Intermediate Aquifer beneath the Site, not

the Lower Aquifer. Beneath the Site the Lower Aquifer corresponds to the 300 foot thick sequence of sand and gravel in the bedrock valley. Bedrock typically occupies this interval in the regional stratigraphic sequence.

The elevation of the Bedrock surface beneath the Site is variable, and therefore, so is the thickness of the Lower Aquifer. CRA based the base elevations cited in the list above on the elevation of the Bedrock at monitoring well WTB, the only on-Site monitoring well that intersected the Bedrock.

The depth to groundwater in the vicinity of the Site is relatively shallow, ranging from less than 10 feet to 25 feet with typical depths ranging from 10 to 15 feet. The elevation of groundwater in the vicinity of the Site ranges from 760 to 745 feet AMSL.

4.0 GROUNDWATER ELEVATION MONITORING

CRA completed quarterly groundwater elevation monitoring rounds on:

- Q1 – October 27, 2008
- Q2 – February 9, 2009
- Q3 – April 28, 2009
- Q4 – August 3, 2009
- Q5 – November 2, 2009
- Q6 – February 24, 2010

CRA included groundwater elevation contour maps for the Upper Aquifer, Intermediate Aquifer and Lower Aquifer based on data collected during the October 27, 2008 and February 9, 2009 events in the Phase I Groundwater Investigation Report (CRA, May 2009). Figures 4.1 through Figures 4.12 present groundwater elevation contours derived from groundwater elevation data collected from April 28, 2009 through February 24, 2010 for the Upper Aquifer, Intermediate Aquifer and Lower Aquifer.

As shown on Figures 4.1, 4.2, 4.3, and 4.4, groundwater in the Upper Aquifer typically flows in a southerly direction. Overall groundwater flow is to the south, consistent with the regional groundwater flow pattern. Superimposed on the regional flow are local features. For example, the groundwater elevation in monitoring well WT116A fluctuates and is occasionally on the order of three feet higher than nearby monitoring wells. There is a groundwater flow divide in the vicinity of WT116A, with shallow groundwater flowing south to southwest on the west of WT116A and flowing south to southeast on the east of WT116A.

As shown on Figures 4.5 through 4.8, groundwater in the Intermediate Aquifer typically flowed in a southerly direction consistent with the regional groundwater flow pattern. The groundwater elevation in Intermediate Aquifer monitoring well WT101B fluctuates relative to groundwater elevations in nearby monitoring wells. Continued monitoring is recommended to determine if this is a seasonal condition.

Similar to the Upper Aquifer monitoring well network, most of the monitoring wells in the Intermediate Aquifer straddle the southern Site boundary with most of the remaining wells located on the northern Site boundary. As a result, there are *insufficient data to determine the groundwater flow direction in the Intermediate*

Aquifer immediately east of the Site. The Phase II monitoring wells, installed in May 2010 will address this data gap.

Figures 4.9 through 4.12, present the results from the groundwater elevation monitoring events for the Lower Aquifer. These data indicate a south-southeasterly groundwater flow direction in the Lower Aquifer consistent with the regional groundwater flow pattern.

Based on the April 28, 2009, August 3, 2009, November 2, 2009, and February 24, 2010 groundwater elevation monitoring events, the horizontal hydraulic gradient across the Site ranged from 0.001 to 0.002 feet/feet in the Upper Aquifer, 0.001 to 0.002 feet/feet in the Intermediate Aquifer, and was consistently estimated to be 0.001 feet/feet in the Lower Aquifer.

Figure 4.13 presents the vertical gradients between the hydrostratigraphic units as measured on February 24, 2010. There is generally an upward gradient across all units on the Site, ranging from approximately 0.00003 feet/feet to 0.04 feet/feet. Occasional slight downward gradients were also observed in monitoring wells nests located north of the Site at WTB (November 2009 and February 2010), WT102 (October 2008, January 2009, February 2009, August 2009, and November 2009), and WT112 (February 2009). CRA consistently observed slight downward gradients in well nest WT113 and southern well nest WT116. CRA also observed slight downward gradients across some zones at southeastern well nest WT101 (April 2009, August 2009, November 2009, and February 2010).

The direction of groundwater flow and the gradients observed during the Phase I Groundwater Investigation were consistent with the conditions during the April 2009 through February 2010 monitoring period.

5.0 GROUNDWATER QUALITY

5.1 INTRODUCTION

The objectives of the groundwater investigation and routine groundwater monitoring include an evaluation of groundwater quality around the perimeter of the landfill, immediately east of the Site, and south of the Site. This section of the Annual Groundwater Monitoring report describes the groundwater quality in the vicinity of the Site and in particular discusses the data currently available with respect to the nature and extent of groundwater contamination emanating from the Site. The Phase I Groundwater Investigation was the first stage of data collection and analysis to supplement the existing data from the monitoring well network. The results of the Phase I Groundwater Investigation identified several data gaps and the Phase II Groundwater Investigation, which the Himco Site Trust will complete in 2010, will aid in addressing the data gaps.

The following are the groundwater quality monitoring rounds CRA has completed at the Site to date:

- Baseline Groundwater Sampling (Q1) - October 28 to November 19, 2008
- Interim Monitoring Program (Q2) - February 9 to February 19, 2009
- Interim Monitoring Program (Q3) - April 29 to May 6, 2009
- Interim Monitoring Program (Q4) - August 4 to August 18, 2009
- Interim Monitoring Program (Q5) - November 3 to November 11, 2009
- Interim Monitoring Program (Q6) - February 23 to March 4, 2010

Section 5.0 includes an evaluation of the groundwater quality data collected at the Site to date. The Phase I Groundwater Investigation report (CRA, May 2009) previously provided the results of the Q1 and Q2 sampling events. The data presented on the figures in this Annual Monitoring Report are restricted to the last four quarterly monitoring events, Q3 through Q6. CRA also evaluated trends in the groundwater quality data and calculated background concentrations for metals and general chemistry parameters. The summary of detected compounds and statistical evaluations of the trends in groundwater quality data were based on Q1 through Q6 results. The background concentration evaluation included all available groundwater quality data from the background monitoring wells, and is summarized in Appendix E.

CRA has uploaded the database into an in-house software tool called e:DAT (electronic data access tool). The e:DAT for this Site can also be used to access aerial imagery, stratigraphic logs and any relevant well construction diagrams. Appendix A includes a copy of the e:DAT. Analytical results for Q1 through Q6 of the Interim Monitoring Program are compiled in Appendix B. Appendix C provides laboratory reports and data validation memoranda for Q3 through Q6 of the Interim Monitoring Program. Q1 and Q2 analytical results and data validation memos were previously submitted to USEPA in the Phase I Groundwater Investigation Report (CRA, May 2009). CRA validated the groundwater analytical data in accordance with the Quality Assurance Project Plan (QAPP) included in the Remedial Design Work Plan (CRA, November 2008). Stabilization parameters measured during Q1 through Q6 Interim Monitoring Program are provided in Appendix D.

CRA completed trend analysis as part of the evaluation of routine groundwater monitoring data collected at the Site. Appendix E provides the trend analysis. The trend analysis included groundwater quality data collected during rounds Q1 through Q6 of the Interim Monitoring Program. Table 5.1 is a summary of the results of the trend analysis. CRA selected the analytes included in the trend analysis based on the frequency of detection and the results of screening against applicable groundwater quality criteria as follows:

<i>Analyte</i>	<i>Rationale</i>
1,1-Dichloroethane	Detected in more than 20 percent of groundwater samples
Benzene	Exceeds Primary MCL
bis(2-Ethylhexyl)phthalate (DEHP)	Exceeds Primary MCL
Calcium	Principal landfill waste component, exceeds RDA
Carbon disulfide	Detected in more than 20 percent of groundwater samples
cis-1,2-Dichloroethene	Detected in more than 20 percent of groundwater samples
Iron	Exceeds Secondary MCL
Manganese	Exceeds Secondary MCL
Sulfate	Exceeds Secondary MCL
Vinyl chloride	Detected in more than 20 percent of groundwater samples

CRA's approach to screening organic chemicals was different than the approach to screening metals and general chemistry parameters because the former are typically the result of waste disposal activities while the latter also occur naturally in groundwater.

Metals and general chemistry parameters were analyzed in groundwater samples collected from monitoring wells WT102A, WT102B, and WT102C located approximately 1260 feet north and upgradient of the Site. CRA performed statistical analysis on these data to determine background concentrations to compare with values measured at other locations at the Site. The details of the statistical analysis and the background concentrations are included in Appendix E. The background concentrations for the metals and general chemistry are discussed in Section 5.4, below.

5.2 VOLATILE ORGANIC COMPOUNDS

Since October 2008 and the commencement of routine groundwater sampling at the Site a total of 177 groundwater samples were collected from 29 monitoring wells and analyzed for 48 VOC analytes. Table 5.2 summarizes the VOCs detected in groundwater samples collected from the monitoring wells. CRA reviewed the frequency of detections of the individual VOCs and screened VOCs results against Primary MCLs. The VOCs that exceeded Primary MCLs and the most frequently detected VOCs are discussed below. Figure 5.1 shows the well locations and results from the last four rounds of quarterly sampling for the selected VOCs.

Benzene was the only VOC detected in routine groundwater monitoring samples at concentrations that were greater than its Primary MCL, and for that reason benzene is discussed below and included in the trend analysis.

Only four VOCs were detected in more than 20 percent of the groundwater samples collected during routine groundwater monitoring:

- 1,1-Dichloroethane (1,1-DCA) = 26.9 percent
- Cis-1,2-Dichloroethene (cis-1,2-DCE) = 22.3 percent
- Vinyl chloride = 28.5 percent
- Carbon disulfide = 23.1 percent

These analytes were also selected for discussion purposes and trend analysis because they are the most widespread VOCs detected in groundwater samples collected from the monitoring wells.

5.2.1 BENZENE

As shown in Table 5.2, benzene was detected in 31 of 177 groundwater samples collected from the monitoring well network, or 17.5 percent of the monitoring well samples. When it was detected the concentration of benzene ranged from 0.26 J micrograms per litre (µg/L) to 12 µg/L.

The concentration of benzene was greater than the Primary MCL of 5 µg/L in seven of the routine groundwater monitoring samples, all collected from monitoring well WT115A. As shown on Figure 5.1, monitoring well WT115A is located in the southeast corner of the landfill and is within the limit of waste. The benzene results from routine groundwater monitoring samples collected from WT115A were as follows:

Benzene at WT115A	
<i>Date</i>	<i>Concentration (µg/L)</i>
11/6/2008	5.7/9.3 ^(D)
2/12/2009	12
5/6/2009	1.0 U/0.43 J
8/5/2009	9.9
11/6/2009	12/12
3/2/2010	9.8
^(D) – Duplicate sample result	
J – estimated concentration	
U – not detected at the associated value	

As described in the trend analysis presented in Appendix E, CRA did not identify any trends in the benzene results from groundwater samples collected from WT115A. This is consistent with stable plume conditions.

Benzene was also detected in routine groundwater monitoring samples collected from six other monitoring wells, as follows:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	6/6	1.2 - 3.3
WT106A	3/6	1.0 U - 0.51 J
WT111A	6/6	0.28 J - 0.83 J
WT116A	3/3	1.7 - 3.8
WT117A	1/6	1.0 U - 0.71 J
WT117B	4/6	1.0 U - 0.66 J
J - estimated concentration		
U - not detected at the associated value		

As shown on Figure 5.1, these monitoring well are located along the southern limit of waste or, in the case of WT106B, south of the southeast corner of the Site. Six of the wells are in the Upper Aquifer with WT117B in the Intermediate Aquifer. The pattern of widespread, low concentration VOCs along the southern edge of the landfill suggests a relatively weak, local source of benzene somewhere in the vicinity of WT115A.

5.2.2 1,1-DICHLOROETHANE (1,1-DCA)

As summarized in Table 5.2, 1,1-DCA was detected in 50 of 177 routine groundwater samples collected from the monitoring well network, or 28.1 percent of the samples. The range of concentrations for the samples where 1,1-DCA was detected range from 0.23 J µg/L to 7.4 µg/L. There is no MCL for 1,1-DCA.

One of the Remedial Action Objectives (RAOs) for groundwater is "to prevent the use of groundwater which contains carcinogens in excess of MCLs or that present a total excess cancer risk above EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} for all site related contaminants...". In the absence of a MCL for 1,1-DCA, USEPA has requested that the PSDs consider the Regional Screening Levels (RSL) Tapwater. The RSL Tapwater for 1,1-DCA is 2.4 µg/L assuming a Carcinogenic Total Risk (TR) of 1×10^{-6} [USEPA Regional Screening Level (RSL) Tapwater Supporting Table, May 2010]; the RSL for 1,1-DCA would therefore be 24 µg/L assuming an excess cancer risk of 1×10^{-5} . It is appropriate, therefore, in the absence of a MCL, to consider an RSL Tapwater of 24 µg/L for 1,1-DCA when evaluating groundwater data for the Site.

1,1-DCA was detected in routine groundwater monitoring samples collected from the following monitoring wells:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	6/6	2.1 - 5.2
WT101B	6/6	0.29 J - 1.2
WT106A	6/6	1.2 - 1.7
WT111A	6/6	1.9 - 6.5
WT114B	6/6	1.9 - 2.3
WT115A	7/9	1.0 U - 4.1
WT116A	3/3	5.0 - 7.4
WT117A	5/7	1.0 U - 5.0
WT117B	5/6	1.0 U - 6.3
J - estimated concentration		
U - not detected at the associated value		

As shown on Figure 5.1, 1,1-DCA was detected in groundwater samples collected during the routine groundwater monitoring at wells WT101A, WT101B, WT111A, WT115A, WT116A, WT117A, and WT117B, located along the southern Site boundary. 1,1-DCA was not detected in any groundwater samples at concentrations above the calculated RSL Tapwater of 24 µg/L. 1,1-DCA was not detected at a reporting detection limit (RDL) of 1.0 µg/L in groundwater samples collected from WT104A and WT105A, located south of the Site. However, it was detected in the groundwater samples collected from WT106A, located south of the southeast corner of the Site. 1,1-DCA was detected east of the Site in groundwater samples collected from Intermediate Aquifer monitoring well WT114B, but at a concentration less than the calculated RSL Tapwater. 1,1-DCA was not detected in groundwater samples collected from Upper Aquifer monitoring well WT114A.

The pattern of widespread, low-concentration 1,1-DCA detections is not consistent with a distinct, high-concentration VOC source. The distribution of 1,1-DCA in groundwater at the Site is more consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

5.2.3 CIS-1,2-DICHLOROETHENE (CIS-1,2-DCE)

Cis-1,2-DCE was detected in 39 of 177 routine groundwater samples collected from the monitoring well network, or 22.0 percent of the samples. The range of concentrations for the samples where cis-1,2-DCE was detected is from 0.21 J µg/L to 2.4 µg/L. None of these concentrations were greater than the Primary MCL of 70 µg/L for cis-1,2-DCE.

The distribution of cis-1,2-DCE is almost identical to the distribution of 1,1-DCA. Cis-1,2-DCE was detected in groundwater samples from the following wells:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	5/6	1.0 U - 0.35 J
WT106A	6/6	0.41 J - 0.60 J
WT111A	6/6	0.35 J - 1.3
WT114B	6/6	0.57 J - 0.64 J
WT115A	7/9	1.0 U - 0.34 J
WT116A	3/3	1.2 - 2.4
WT117A	1/7	1.0 U - 0.63 J
WT117B	5/6	1.0 U - 0.59 J
J - estimated concentration		
U - not detected at the associated value		

As shown on Figure 5.1, cis-1,2-DCE was detected in groundwater samples collected WT101A, WT111A, WT115A, and WT117B, located along the southern Site boundary. Cis-1,2-DCE was not detected (RDL=1.0 µg/L) in groundwater samples collected from WT104A and WT105A, but it was detected in the groundwater sample collected from WT106A, located south of the Site. Cis-1,2-DCE was also detected east of the Site in groundwater samples collected from Intermediate Aquifer monitoring well WT114B, but not Upper Aquifer well WT114A.

5.2.4 VINYL CHLORIDE

As shown in Table 5.2, vinyl chloride was detected in 51 of 177 groundwater samples collected from the monitoring well network during routine groundwater monitoring or 28.8 percent of the samples. When vinyl chloride was detected, its concentration ranged from 0.22 J µg/L to 1.3 µg/L, as follows:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	4/6	1.0 U - 0.37 J
WT101B	3/6	1.0 U - 0.65 J
WT106A	2/6	1.0 U - 0.23 J
WT111A	5/6	0.28 J - 0.58 J
WT115A	7/9	1.0 U - 0.74 J
WT116A	3/3	0.75 J - 1.3
WT116B	5/6	1.0 U - 0.55 J
WT117A	1/7	1.0 U - 0.65 J
WT117B	4/6	1.0 U - 0.87 J
WT118B	7/7	0.43 J - 0.71 J
WTB1	1/6	1.0 U - 0.22 J
WTB4	1/6	1.0 U - 0.50 J
WTE1	2/7	1.0 U - 0.39 J
WTE3	6/6	0.27 J - 1.3
J - estimated concentration		
U - not detected at the associated value		

None of these concentrations were greater than the Primary MCL of 2 µg/L for vinyl chloride. As shown on Figure 5.1, 11 of the 14 monitoring wells listed above are located along the southern limit of waste or between the limit of waste and the southern Site boundary. Vinyl chloride was detected in two of six groundwater samples collected from WT106A, located south of the Site. Vinyl chloride was detected in one of six samples collected from each of monitoring wells WTB1 and WTB4, located along the northern Site boundary.

CRA evaluated trends in the groundwater quality data and identified a decreasing trend in the vinyl chloride concentrations in groundwater samples collected from Intermediate Aquifer monitoring well WT117B. A detailed discussion of the trend analysis is provided in Appendix E.

WTB1 is a Lower Aquifer monitoring well located along the northern Site boundary. Vinyl chloride was detected in the November 2008 sample collected from this well but not in the samples collected subsequently. WTB4 is a Lower Aquifer monitoring well located along the northern Site boundary. Vinyl chloride was detected in the March 2010 sample collected from WTB4, but not in any of the previous samples. Vinyl chloride was not detected (RDL=1.0 µg/L) in any of the groundwater samples collected from Upper Aquifer well WTB2 or Intermediate Aquifer well WTB3. Ongoing

monitoring will provide data to evaluate the presence/absence of vinyl chloride in groundwater samples collected from WTB1 and WTB4.

Vinyl chloride was not detected (RDL=1.0 µg/L) east of the Site in groundwater samples collected from monitoring well WT114A and WT114B.

The widespread low level vinyl chloride detections in the routine groundwater monitoring samples do not suggest a distinct source with a high concentration VOC plume emanating from the landfill. Vinyl chloride is produced in reducing environments by the degradation of chlorinated organic compounds such as TCE. The distribution of vinyl chloride in groundwater in the vicinity of the Himco Site is more consistent with residual contamination undergoing degradation, probably with no ongoing source of VOC contaminants.

5.2.5 CARBON DISULFIDE

Carbon disulfide was detected in 37 of 177 routine groundwater samples, or 20.9 percent of the samples. The concentrations for the samples where carbon disulfide was detected range from 0.29 µg/L to 3.6 µg/L. There is no MCL for carbon disulfide.

In the absence of a MCL for carbon disulfide, USEPA has requested that the PSDs consider the Regional Screening Levels (RSL) Tapwater. The RSL Tapwater for carbon disulfide is 1,000 µg/L assuming a Carcinogenic Total Risk (TR) of 1×10^{-6} [USEPA Regional Screening Level (RSL) Tapwater Supporting Table, May 2010]; the RSL for carbon disulfide would therefore be 10,000 µg/L assuming an excess cancer risk of 1×10^{-5} . Consistent with the approach used on other sites for the application of screening levels, it is appropriate, therefore, in the absence of a MCL, to consider an RSL Tapwater of 10,000 µg/L for carbon disulfide when evaluating groundwater data for the Site.

Carbon disulfide was detected in groundwater samples from the following wells:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	2/6	1.0 U - 0.51 J
WT101B	5/6	1.0 U - 3.4
WT102B	3/7	1.0 U - 0.56 J
WT102C	1/6	1.0 U - 0.52 J
WT111A	3/6	1.0 U - 0.71 J
WT112B	1/6	1.0 U - 0.66 J
WT114B	1/6	1.0 U - 0.45 J
WT115A	5/9	1.0 U - 3.6
WT116A	1/3	1.0 U - 0.56 J
WT116B	1/6	1.0 U - 0.60 J
WT117B	1/6	1.0 U - 0.93 J
WT118B	1/7	1.0 U - 0.29 J
WTB4	4/6	1.0 U - 3.6
WTE1	3/7	1.0 U - 1.8
WTE3	5/6	1.0 U - 3.2
J - estimated concentration		
U - not detected at the associated value		

Carbon disulfide was not detected in any groundwater samples at concentrations above the calculated RSL Tapwater of 10,000 µg/L.

Similar to vinyl chloride, the degradation of chlorinated organic compounds may produce carbon disulfide. As shown on Figure 5.1, the distribution of carbon disulfide is similar to the distribution of vinyl chloride and is consistent with residual contamination undergoing degradation.

5.3 SEMI-VOLATILE ORGANIC COMPOUNDS

CRA has collected a total of 177 groundwater samples from 28 monitoring wells and analyzed them for 65 SVOC analytes since routine groundwater sampling began in October 2008. The SVOCs detected in groundwater samples collected from monitoring wells during the Phase I Groundwater Investigation are summarized in Table 5.3. CRA reviewed the frequency of detections of the individual SVOCs and screened SVOCs

results against Primary MCLs. The SVOCs that exceeded Primary MCLs and the most frequently detected SVOCs are discussed below.

Bis(2-Ethylhexyl)phthalate was the only SVOCs analyte detected at concentrations that were greater than its Primary MCL (6 µg/L) in groundwater samples collected during routine groundwater monitoring. Bis(2-Ethylhexyl)phthalate was selected for discussion purposes because it is the only SVOC detected at the concentrations greater than its Primary MCL. Bis(2-Ethylhexyl)phthalate was also the most widely detected SVOC and was detected in 18.1 percent of the routine groundwater samples.

5.3.1 BIS(2-ETHYLHEXYL)PHTHALATE

Bis(2-Ethylhexyl)phthalate was detected in 32 of 177 groundwater samples collected from the monitoring well network, or 18.1 percent of the routine groundwater monitoring samples. Figure 5.2 presents bis(2-Ethylhexyl)phthalate results from the routine groundwater monitoring.

The concentration of bis(2-Ethylhexyl)phthalate in the groundwater samples ranged from 0.84 µg/L to 13 µg/L. Only two of the 35 detections of bis(2-Ethylhexyl)phthalate were greater than the Primary MCL of 6 µg/L. The concentration of bis(2-Ethylhexyl)phthalate in the groundwater sample collected from Upper Aquifer monitoring well WT112A on October 29, 2008 was 13 µg/L. Bis(2-Ethylhexyl)phthalate was not detected (RDL=2 µg/L) in five of seven groundwater samples collected from WT112A since October 2008.

As shown on Figure 5.2, WT113B is located along the northern Site boundary. Bis(2-Ethylhexyl)phthalate was detected at a concentration of 9.2 µg/L in the August 18, 2009 groundwater sample collected from WT113B, but it was not detected (RDL = 2 µg/L) in any of the previous or subsequent groundwater samples.

Bis(2-Ethylhexyl)phthalate was detected in two of seven groundwater samples collected from the monitoring wells in background monitoring well nest WT102, located north of the Site. Eighteen of the 35 groundwater samples where bis(2-Ethylhexyl)phthalate was detected were collected from the background wells or wells on the upgradient, northern Site boundary (WT102A, WT102B, WT113A, WT102C, WT112A, WT112B, WTB1, WTB3, and WTB4). Other wells where bis(2-Ethylhexyl)phthalate was detected are located along the southern portion of the Site (WT101A, WT101C, WT115A, and WT116B, WTE1 and WTE3), south of the Site (WT104A) and WT105A and east of the Site (WT114A). These wells were installed in all three of the Upper, Intermediate and Lower Aquifers.

The bis(2-Ethylhexyl)phthalate was detected in groundwater samples that are widely dispersed, both laterally and vertically, and typically at low concentrations. This is not the pattern a distinct, high concentration source of SVOCs would create, namely a plume emanating from the landfill. In fact, the presence of bis(2-Ethylhexyl)phthalate at relatively large distances both upgradient and downgradient of the Site suggests that the detected values at the Site may not be completely, if at all, attributable to Site activities.

5.4 METALS

CRA has collected a total of 177 groundwater samples from 28 monitoring wells and analyzed them for TAL metals. The metals detected in groundwater samples collected during routine groundwater monitoring are summarized in Table 5.4. CRA screened metals results against four sets of criteria:

- 1) Primary MCLs, which are health-based criteria
- 2) Secondary MCLs which are aesthetic water quality criteria
- 3) RDAs, which are health-based criteria for specific dietary concerns with respect to iron, sodium, and calcium
- 4) Background Threshold Values (BTVs) calculated from the concentrations of metal and general chemistry parameters from groundwater samples collected from the WT102 monitoring well nest located north (upgradient) of the Site

Metals were analyzed in groundwater samples collected from monitoring wells WT102A, WT102B, and WT102C located approximately 1260 feet north and upgradient of the landfill. A statistical analysis was performed on these values to determine background concentrations to compare with values measured at other locations at the Site. The details of the statistical analysis and the background concentrations are included in Appendix E. Tables 5.5 through 5.7 provide the background concentrations for the metals parameters for the Upper, Intermediate, Lower and combined Aquifers. Several of the background threshold values (BTVs) exceeded either their respective Primary MCL, Secondary MCL or RDA. If additional background groundwater quality data are collected during the course of the Interim Groundwater Monitoring Program, CRA will recalculate the BTVs based on this revised data set and include the results in the Phase II Groundwater Investigation Report.

5.4.1 PRIMARY MCLS

A total of five metals were detected at concentrations that were greater than their Primary MCLs during the routine groundwater monitoring. They were arsenic, beryllium, chromium, lead and thallium. The duplicate groundwater samples collected from WT115A in November 2008 contained all exceedances of beryllium, lead and thallium, two of four chromium exceedances, and two of three arsenic exceedances. Analytical results for metals analysis of groundwater samples collected from Upper Aquifer monitoring well WT115A are provided on Table 5.8. Upper Aquifer monitoring well WT115A is located in the southeast corner of the Site on the perimeter of the waste and approximately 200 feet north of the southern Site boundary.

The turbidity of the samples collected from WT115A was elevated, as follows:

<i>Sample Date</i>	<i>Sample Turbidity (NTU)</i>
11/6/2008	190
2/12/2009	60.3
5/6/2009	72.9
8/5/2009	79.9
8/5/2009	4.73
3/2/2010	49.4

This limits the reliability of these metals results, which may be biased high due to elevated sample turbidity; however, groundwater samples collected during rounds Q2 through Q6 did not contain any of the metals cited above at concentrations that exceeded their Primary MCLs.

The other arsenic exceedance occurred in the groundwater sample collected from Upper Aquifer monitoring well WT106A on February 26, 2010. WT106A is located approximately 400 feet south of the southeast corner of the Site. Arsenic was present at a concentration of 38.6 µg/L versus the Primary MCL of 10 µg/L and a BTU of 6.7 U µg/L. Previous arsenic results from groundwater samples collected from WT106A ranged from 1.6 µg/L to 9.0 µg/L. Turbidity values for the routine groundwater monitoring samples collected from WT106A ranged from 0.98 NTU to 4.45 NTU, therefore the WT106A arsenic exceedance is not the result of elevated turbidity. Continued groundwater quality monitoring will determine if the arsenic concentration in groundwater samples collected from WT106A persistently exceed the Primary MCL.

Chromium exceeded the Primary MCL in two groundwater samples collected from background monitoring well WT102A during rounds Q5 and Q6 of the Interim

Groundwater Monitoring Program. The exceedances are not Site related because they occur in the background well located north (upgradient) of the Site. Ongoing routine groundwater quality monitoring will determine if the exceedance of the chromium Primary MCL persists.

5.4.2 SECONDARY MCLS

As summarized in Table 5.4, aluminum, iron, and manganese were the only metals detected at concentrations that were greater than their respective Secondary MCLs in groundwater samples collected during routine groundwater monitoring. Iron and manganese were greater than their respective Secondary MCLs in 153 and 124 samples, respectively, out of a total of 177 samples. Aluminum was greater than the Secondary MCL in 53 of 177 groundwater samples. CRA selected iron and manganese for discussion purposes because of their more numerous exceedances of their respective Secondary MCLs. Figures 5.3, 5.4, and 5.5 provide iron results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively. Figures 5.6, 5.7, and 5.8 provide manganese results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively.

The concentration of iron in groundwater samples collected from Upper Aquifer monitoring wells is shown on Figure 5.3. There is a plume of iron in the Upper Aquifer defined by the 300 µg/L contour, which is the Secondary MCL for iron. The northeast and southwest limits of the iron plume are delineated by the results from groundwater samples collected from monitoring wells WT113A and WT104A, respectively. Iron was not routinely detected (RDL=100 µg/L) in the samples from WT113A and WT104A. The iron plume extends from the northwest to the southeast corner of the Site, as defined by iron concentrations in excess of 300 µg/L. Iron concentrations in excess of 300 µg/L extended off Site to the southeast. The peak concentration of iron in the Upper Aquifer was 308,000 µg/L in a groundwater sample collected from monitoring well WT101A, located in the southeast corner of the Site. The Upper Aquifer BTV for iron is 7,720 µg/L. It was exceeded in four of four recent groundwater samples collected from WT101 and one of four samples collected from WT106A, WT115A and WT116A, located in, or downgradient of, the southeast corner of the Site.

Figure 5.4 shows the concentration of iron in groundwater samples collected from Intermediate Aquifer monitoring wells. Beneath the southwest portion of the Site, and immediately east of the Site, the concentration of iron in groundwater was greater than 2,000 µg/L, which exceeds the Secondary MCL of 300 µg/L and the BTV of 1,870 µg/L for iron in the Intermediate Aquifer. The maximum concentration of 6,200 µg/L for iron

in the Intermediate Aquifer in the last four routine groundwater samples was in a sample collected from monitoring well WT117B, located along the southern Site boundary. However, the concentration of iron in the Intermediate Aquifer decreased beneath the southeast corner of the Site. Groundwater samples collected from Intermediate Aquifer monitoring wells WTE1 and WT101B, located in the southeast corner of the Site, were typically less than 1,000 µg/L and less than 500 µg/L, respectively.

Figure 5.5 shows the concentration of iron in groundwater samples collected from Lower Aquifer monitoring wells. The concentration of iron in groundwater samples collected from Lower Aquifer monitoring wells in the last four routine groundwater monitoring events ranged from 110 µg/L in a groundwater sample collected from monitoring well WTB4, located on the northern Site boundary, to 3,330 µg/L in a groundwater sample collected from background monitoring well WT102C, located 1,200 feet north of the Site boundary. The Lower Aquifer BTV for iron is 4,930 µg/L. The combined BTV for iron is 3,580 µg/L. Iron concentrations in groundwater samples collected from the on-Site monitoring wells during the last four groundwater monitoring rounds did not exceed either BTV.

Figure 5.6 shows the concentration of manganese in groundwater samples collected from Upper Aquifer monitoring wells during the last four routine groundwater monitoring events. There is a plume of manganese in the Upper Aquifer defined by the 50 µg/L contour, which is the Secondary MCL for manganese. The northeast and southwest limits of the manganese plume are delineated by manganese results which were less than 15 µg/L from groundwater samples collected from monitoring wells WT113A and WT104A, respectively. The manganese plume extended from the northwest to the southeast corner of the Site, as defined by manganese concentrations in excess of 50 µg/L. The Upper Aquifer BTV for manganese is 712 µg/L. It was exceeded in groundwater samples collected from WT101A and WT106A. The peak concentration of manganese in the Upper Aquifer was 2,700 µg/L in a groundwater sample collected from monitoring well WT101A, located in the southeast corner of the Site. Manganese concentrations in groundwater samples collected from WT106A, located south of the southeast corner of the Site, occasionally exceeded the BTV.

The Upper Aquifer iron and manganese concentration contours are very similar in appearance, but iron concentrations are typically an order of magnitude higher than concentrations of manganese.

Figure 5.7 shows the concentration of manganese in groundwater samples collected from Intermediate Aquifer monitoring wells in the last four routine groundwater

monitoring events. Beneath the western portion of Site the concentration of manganese in groundwater was greater than 100 µg/L, which exceeds the Secondary MCL of 50 µg/L. The Intermediate Aquifer BTV for manganese is 173 µg/L. The peak concentration of manganese in the Intermediate Aquifer was 281 µg/L in a groundwater sample collected from monitoring well WTB3, located in the northwest corner of the Site. Manganese concentrations in the Intermediate Aquifer generally decrease to the southeast beneath the Site. The concentration of manganese in the last four routine groundwater samples collected from Intermediate Aquifer monitoring well WT101B, located in the southeast corner of the Site ranged from 33.4 µg/L to 40.6 µg/L.

The concentration of manganese in groundwater samples collected from Lower Aquifer monitoring wells are shown on Figure 5.8. Manganese concentrations in the Lower Aquifer generally decreased to the southeast beneath the Site in a pattern that is similar to iron. The concentration of manganese in groundwater samples collected from Lower Aquifer monitoring wells in the last four monitoring rounds ranged from 9.5 µg/L in a groundwater sample collected from monitoring well WT101C located in the southeast corner of the Site, to 202 µg/L in a groundwater sample collected from monitoring well WTB4, located on the northern Site boundary. None of these concentrations exceeded the Lower Aquifer BTV for manganese of 570 µg/L. As detailed in the trend analysis presented in Appendix E, CRA identified an increasing trend in manganese concentrations in groundwater samples collected from Lower Aquifer monitoring well WTB3.

5.4.3 RECOMMENDED DAILY ALLOWANCES (RDAs)

As shown on Table 5.4, calcium, iron and sodium were detected at concentrations that were greater than their respective RDAs during routine groundwater monitoring. Iron concentrations were greater than its RDA of 1 mg/L in 103 of 177 samples (58 percent) collected from the monitoring wells. The RDAs for calcium and sodium are 250 mg/L and 150 mg/L, respectively. Calcium and sodium concentrations were greater than their respective RDAs in 18 of 177 samples (10.2 percent) and 7 of 177 samples (4.0 percent), respectively, collected from the monitoring wells during the routine groundwater monitoring.

Iron distribution in groundwater was discussed in Section 5.4.2.

Calcium was selected for discussion purposes because calcium sulfate was one of the principal waste materials disposed of in the landfill. Figures 5.9, 5.10, and 5.11 provide concentrations for calcium in the Upper, Intermediate and Lower Aquifers, respectively.

Calcium concentration contours for the Upper Aquifer are shown on Figure 5.9. There is a plume of calcium in the Upper Aquifer defined by the RDA of 250 mg/L. The Upper Aquifer BTV is 275 mg/L for calcium. The northeast and southwest limits of the calcium plume are delineated by the results from groundwater samples collected from monitoring wells WT112A and WT111A, respectively. The peak calcium concentration in the Upper Aquifer was 815 mg/L in a groundwater sample collected from monitoring well WT116A, located along the southern Site boundary. Calcium concentrations in excess of 100 mg/L extended off Site to the southeast.

The concentration of calcium in groundwater samples collected from Intermediate Aquifer monitoring wells is shown on Figure 5.10. The concentration of calcium in Intermediate Aquifer groundwater was less than the RDA of 250 mg/L with a maximum concentration of 213 mg/L in a groundwater sample collected from monitoring well WT117B, located along the southern Site boundary. The BTV for calcium in the Intermediate Aquifer is 86 mg/L and it was exceeded in groundwater samples collected from monitoring wells WT116B, WT117B, and WT118B, located along the southern Site boundary.

Figure 5.11 shows the concentration of calcium in groundwater samples collected from Lower Aquifer monitoring wells. The concentration of calcium in Lower Aquifer groundwater beneath the Site was less than the RDA of 250 mg/L. The concentration of calcium in groundwater samples collected from Lower Aquifer monitoring wells in the last four monitoring rounds ranged from 49.6 mg/L in a groundwater sample collected from monitoring well WT101C, located in the southeast corner of the Site, to 128 mg/L in a groundwater sample collected from monitoring well WTE3, located on the southern Site boundary. The calcium concentration in the sample collected from WTE3 in May 2009 was the only Lower Aquifer calcium result that exceeded the BTV calcium concentration of 122 mg/L for the Lower Aquifer.

5.5 GENERAL CHEMISTRY PARAMETERS

Groundwater samples collected during the routine groundwater monitoring were analyzed for bromide, cyanide, chloride, and sulfate. The detections of these general chemistry parameters in groundwater samples collected during routine groundwater monitoring are summarized in Table 5.4.

Cyanide was detected in 13 of 148 samples collected during routine groundwater monitoring. Cyanide concentrations ranged from 0.0052 J mg/L to 0.088 mg/L. These results were less than the Primary MCL of 0.2 mg/L for cyanide.

Chloride was detected in 176 of 177 groundwater samples collected from the monitoring well network during the routine groundwater monitoring. The concentration of chloride was greater than its Secondary MCL of 250 mg/L in six of these samples. CRA calculated the following BTVs for chloride:

- Upper Aquifer - 258 mg/L
- Intermediate Aquifer - 55 mg/L
- Lower Aquifer - 71.8 mg/L
- Combined - 182 mg/L

Sulfate was detected in 169 of 176 groundwater samples collected during the routine groundwater monitoring and was greater than its Secondary MCL of 250 mg/L in 30 of these samples. CRA calculated the following BTVs for sulfate:

- Upper Aquifer - 965 mg/L
- Intermediate Aquifer - 430 mg/L
- Lower Aquifer - 68.7 mg/L
- Combined - 430 mg/L

Sulfate was selected for discussion purposes because calcium sulfate was one of the primary waste materials deposited in the landfill and it because it is present at concentrations that are greater than its Secondary MCL numerous times.

Figure 5.12 shows the concentration of sulfate in groundwater samples collected from Upper Aquifer monitoring wells. There is a plume of sulfate in the Upper Aquifer defined by the 250 mg/L contour, which equals its Secondary MCL of 250 mg/L. The peak concentration of sulfate in the Upper Aquifer was 1,160 mg/L in a groundwater sample collected from monitoring well WT116A, located along the southern Site boundary. The groundwater samples collected from WT116A were the only Upper Aquifer groundwater samples with sulfate concentrations that exceed the Upper Aquifer BTV of 965 mg/L for sulfate. South of the Site, the sulfate concentrations in groundwater samples collected from monitoring wells WT104A and WT105A ranged from 7.1/7.2 mg/L (duplicate sample) to 25.2 mg/L.

Figure 5.13 shows the concentration of sulfate in groundwater samples collected from Intermediate Aquifer monitoring wells. Sulfate concentrations were less than 250 mg/L in all the Intermediate Aquifer groundwater samples. Sulfate concentrations in the Intermediate Aquifer beneath the Site are generally greater than 100 mg/L. The concentration of sulfate in groundwater samples collected from Intermediate Aquifer monitoring well WT114B located east of the Site ranged from 95.5 mg/L to 100 mg/L during the last four rounds of routine groundwater monitoring. CRA evaluated trends in the groundwater quality data and identified decreasing trends in the sulfate concentrations in groundwater samples collected from Intermediate Aquifer monitoring wells WT101B, WT102B, and WTE1. The detailed trend analysis is presented in Appendix E.

The concentration of sulfate in groundwater samples collected from Lower Aquifer monitoring wells is shown on Figure 5.14. The concentration of sulfate in groundwater samples collected from Lower Aquifer monitoring wells during the last four monitoring rounds ranged from 0.90 mg/L in a groundwater sample collected from monitoring well WT101C located in the southeast corner of the Site to 186 mg/L in a groundwater sample collected from monitoring well WTE3, located near the southern Site boundary. Sulfate concentrations in groundwater samples collected from Lower Aquifer monitoring wells did not exceed the Secondary MCL. The Lower Aquifer BTV of 68.7 mg/L was exceeded in one of the four samples collected from WTE3, located along the southern Site boundary. As described in the trend analysis presented in Appendix E, CRA identified a decreasing trend in the sulfate concentrations in groundwater samples collected from Lower Aquifer monitoring well WT102C.

6.0 CONCLUSIONS

6.1 GROUNDWATER ELEVATION MONITORING

Groundwater in the Upper, Intermediate and Lower Aquifers typically flow south to southeast, consistent with the regional groundwater flow direction and previous on-Site monitoring.

6.2 GROUNDWATER QUALITY MONITORING

6.2.1 VOCS

Benzene was the only VOC detected at concentrations that were greater than its Primary MCL. All of the benzene exceedances were in groundwater samples from monitoring well WT115A, located in the southeast corner of the landfill.

Only four VOCs were detected in more than 20 percent of the monitoring well samples: 1,1-DCA, cis-1,2-DCE, vinyl chloride, and carbon disulfide. 1,1-DCA, cis-1,2-DCE, and vinyl chloride detections had very similar patterns and were clustered along the southern Site boundary. Statistical trend analysis revealed a decreasing trend in the vinyl chloride concentrations in the groundwater samples collected from Intermediate Aquifer monitoring well WT117B, located along the south west perimeter of the Site. No other trends in VOC concentrations in groundwater were observed.

The broad distribution of low-level VOC detections of degradation products is consistent with residual VOC groundwater contamination undergoing degradation.

The recent (Q3 through Q6) groundwater quality monitoring results are consistent with previous Site monitoring data for VOCs.

6.2.2 SVOCS

Bis(2-Ethylhexyl)phthalate was the only SVOC analyte detected at concentrations that were greater than its Primary MCL (6 µg/L). It was also the most frequently detected SVOC. The sporadic presence of bis(2-Ethylhexyl)phthalate at relatively low concentrations at large distances, both upgradient and downgradient of the Site and sporadically with depth, indicate that it is not attributable to Site activities.

The recent (Q3 through Q6) groundwater quality monitoring results are consistent with previous Site monitoring data for SVOCs.

6.2.3 METALS AND GENERAL CHEMISTRY PARAMETERS

Metals results were screened against four sets of criteria:

- 1) Primary MCLs
- 2) Secondary MCLs
- 3) RDAs
- 4) BTVs

CRA also completed a statistical trend analysis of the concentrations of representative groundwater quality parameters and representative compounds that exceed their respective Primary MCL. CRA recommends additional groundwater quality monitoring data be collected from the background monitoring wells to provide a more robust data set for the analysis of BTVs for metals and general chemistry parameters and for any concentration versus time trends in the background monitoring data.

Arsenic, beryllium, chromium, lead and thallium were the only metals detected at concentrations that were greater than their Primary MCLs. Upper Aquifer monitoring well WT115A is located in the southeast corner of the Site near the perimeter of the waste and approximately 200 feet north of the southern Site boundary. The analytical results for groundwater sample collected from WT115A on November 6, 2008 includes all the exceedances of beryllium, chromium, lead, and thallium and two of three arsenic exceedances. However, the turbidity of the sample collected from WT115A on November 6, 2008 was 190 NTU. This limits the reliability of the metals results, which may be biased high due to elevated sample turbidity. Subsequent groundwater samples collected from WT115A had reduced turbidity and no exceedances of Primary MCLs. The other arsenic exceedance occurred in the February 26, 2010 groundwater sample collected from Upper Aquifer monitoring well WT106A, located approximately 400 feet south of the southeast corner of the Site.

The Upper Aquifer BTV for iron is 7,720 µg/L. Recent groundwater samples collected from monitoring wells located in, or downgradient of, the southeast corner of the Site contained iron at concentrations greater than the Upper Aquifer BTV. Beneath the southwest portion of the Site, and immediately east of the Site, the concentrations of iron in Intermediate Aquifer groundwater samples were greater than 2,000 µg/L, exceeding

the Secondary MCL of 300 µg/L and the BTV of 1,870 µg/L for iron in the Intermediate Aquifer. Groundwater samples collected from Intermediate Aquifer monitoring wells WTE1 and WT101B, located in the southeast corner of the Site, typically contained less than 1,000 µg/L and 500 µg/L of iron, respectively.

The Upper Aquifer BTV for manganese is 712 µg/L. Recent groundwater samples collected from WT101A and WT106A, located in the southeast corner of the Site and south of the southeast corner of the Site, respectively, contained manganese at concentrations greater than the Upper Aquifer BTV. The Intermediate Aquifer BTV for manganese is 173 µg/L. The peak concentration of manganese in the Intermediate Aquifer was 281 µg/L in a groundwater sample collected from monitoring well WTB3, located in the northwest corner of the Site. Manganese concentrations in the Intermediate Aquifer generally decrease as groundwater moves from the northwest to the southeast beneath the Site.

Iron and manganese concentrations in groundwater samples collected from the on-Site Lower Aquifer monitoring wells during the last four groundwater monitoring rounds did not exceed the BTV.

The Upper Aquifer BTV is 275 mg/L for calcium. The northeast and southwest limits of the calcium plume are delineated by the results from groundwater samples collected from monitoring wells WT112A and WT111A, respectively. The peak calcium concentration in the Upper Aquifer was 815 mg/L in a groundwater sample collected from monitoring well WT116A, located along the southern Site boundary. The concentration of calcium in Intermediate and Lower Aquifer groundwater samples occasionally exceeded their respective BTVs in groundwater samples collected from monitoring wells located along the southern Site boundary, but were always less than the RDA of 250 mg/L.

There is a plume of sulfate in the Upper Aquifer defined by the 250 mg/L contour, which equals its Secondary MCL of 250 mg/L; however, the groundwater samples collected from WT116A, located in the south-central portion of the Site, were the only Upper Aquifer groundwater samples with sulfate concentrations that exceed the Upper Aquifer sulfate BTV of 965 mg/L. Sulfate concentrations were less than 250 mg/L in all of the Intermediate and Lower Aquifer groundwater samples.

Additional monitoring wells are warranted to address gaps in the monitoring well network. Additional monitoring wells have been installed as part of the Phase II Groundwater Investigation, and data will be collected from the new wells starting in the seventh quarter of monitoring (June 2010). The scope and rationale for the Phase II

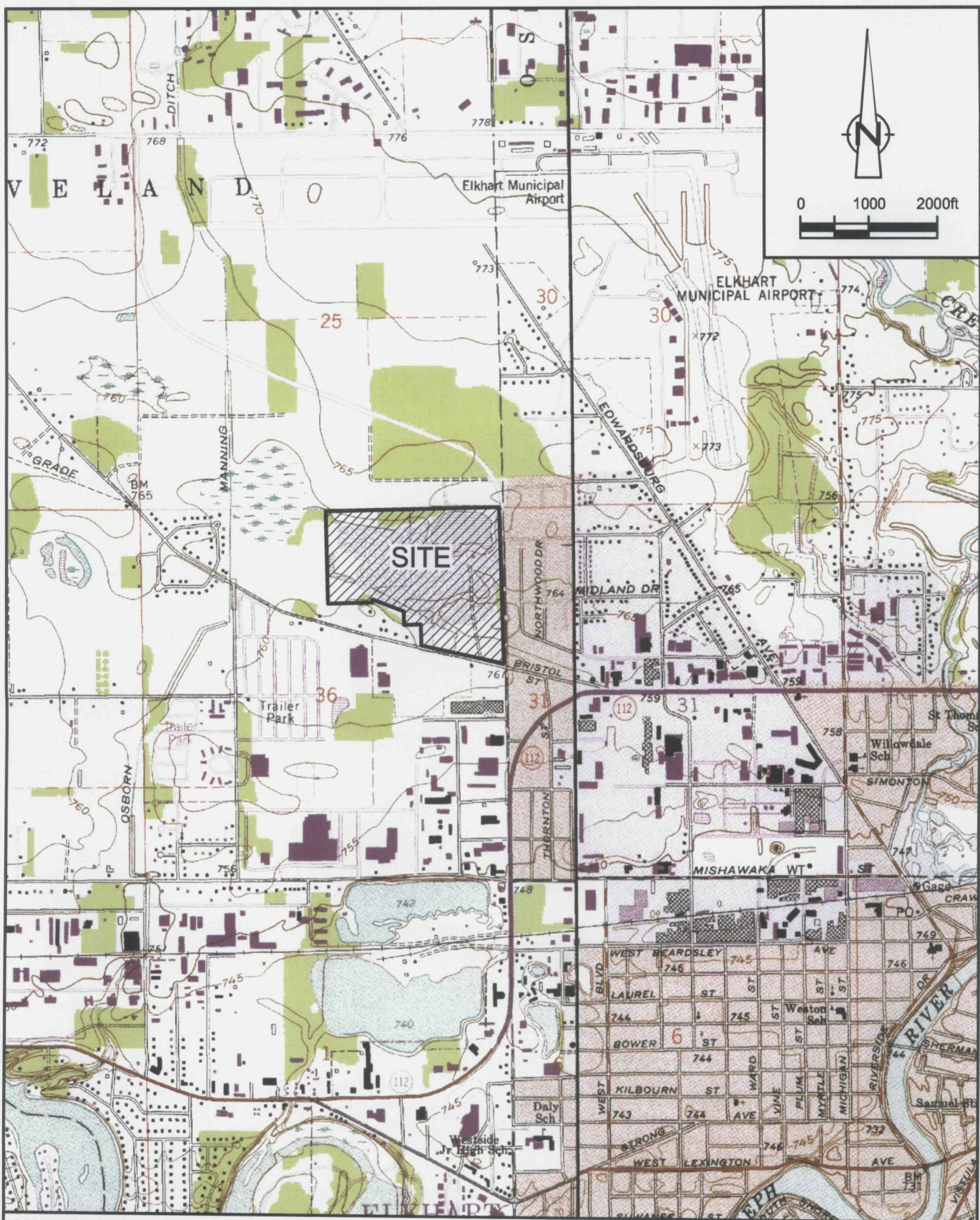
Groundwater Investigation is provided in the Phase I Groundwater Investigation Report (CRA, May 2009).

The recent (Q3 through Q6) groundwater quality monitoring results are consistent with previous Site monitoring data for metals and general chemistry.

7.0 **REFERENCES**

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- Duwelius, R.F. and Silcox, C.A., 1991. Ground-water levels, flow, and quality in northwestern Elkhart County, Indiana, 1980-89: U.S. Geological Survey Water-Resources Investigations Report 91-4053.
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- United States Environmental Protection Agency, December 2002. Supplemental Site Investigations/Site Characterization Report, Himco Dump Superfund Site, Elkhart, Indiana.

FIGURES



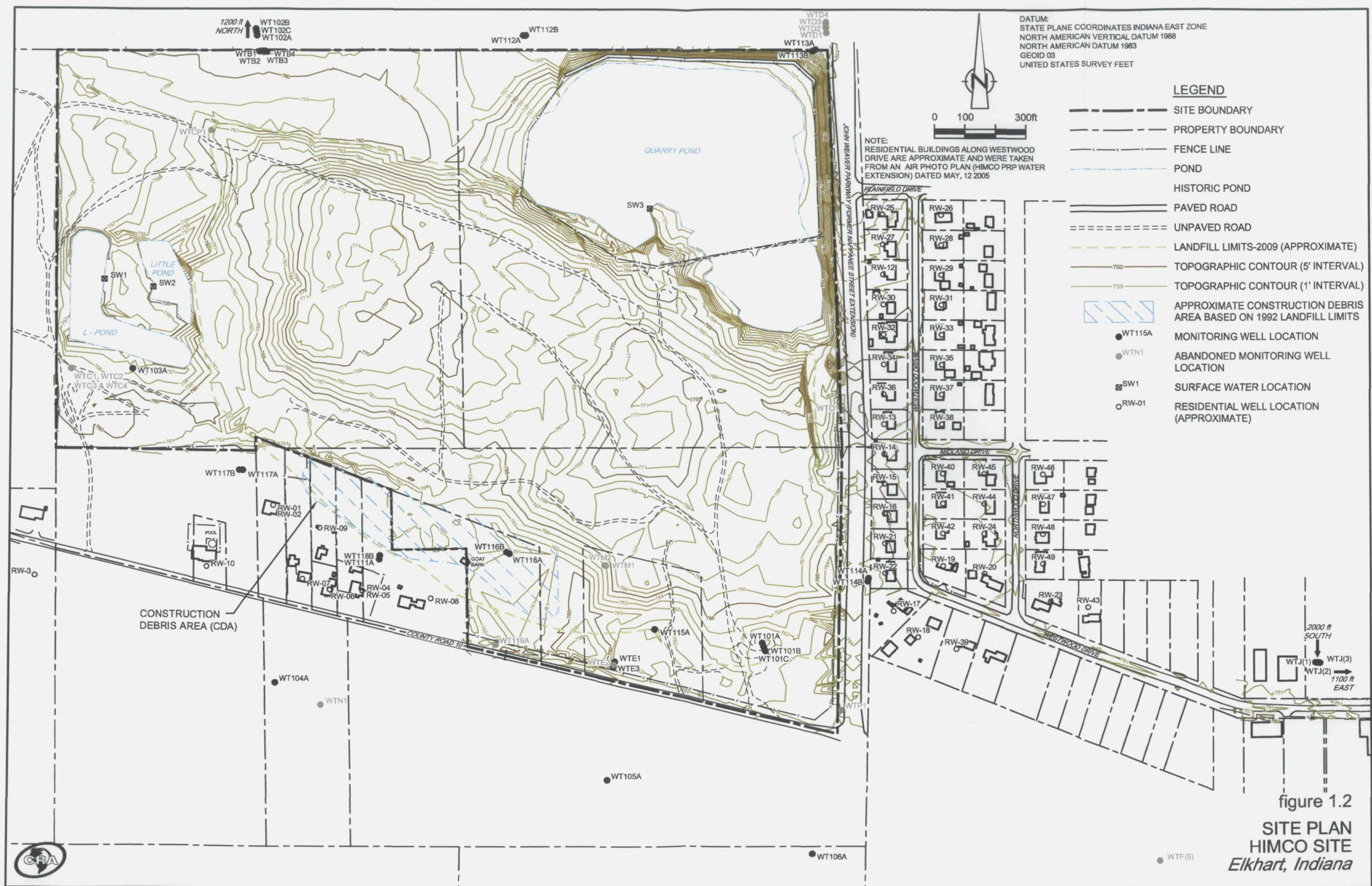
SOURCE: USGS QUADRANGLE MAPS;
ELKHART AND OSCEOLA, INDIANA



39611-00(028)GN-WA030 MAY 20/2010

figure 1.1

SITE LOCATION MAP
HIMCO SITE
Elkhart, Indiana



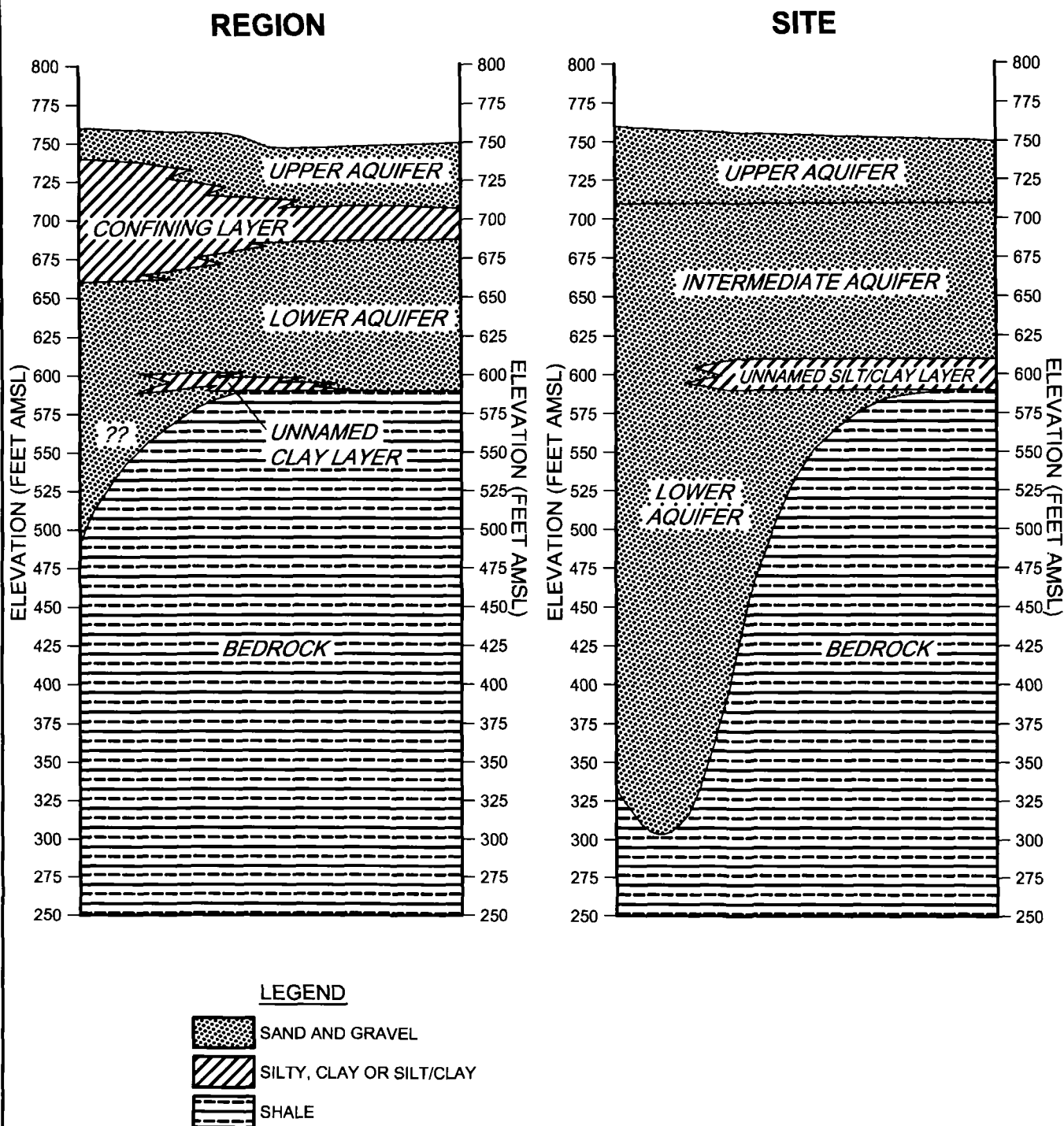


figure 3.1
SCHEMATIC CROSS-SECTION
HIMO SITE
Elkhart, Indiana



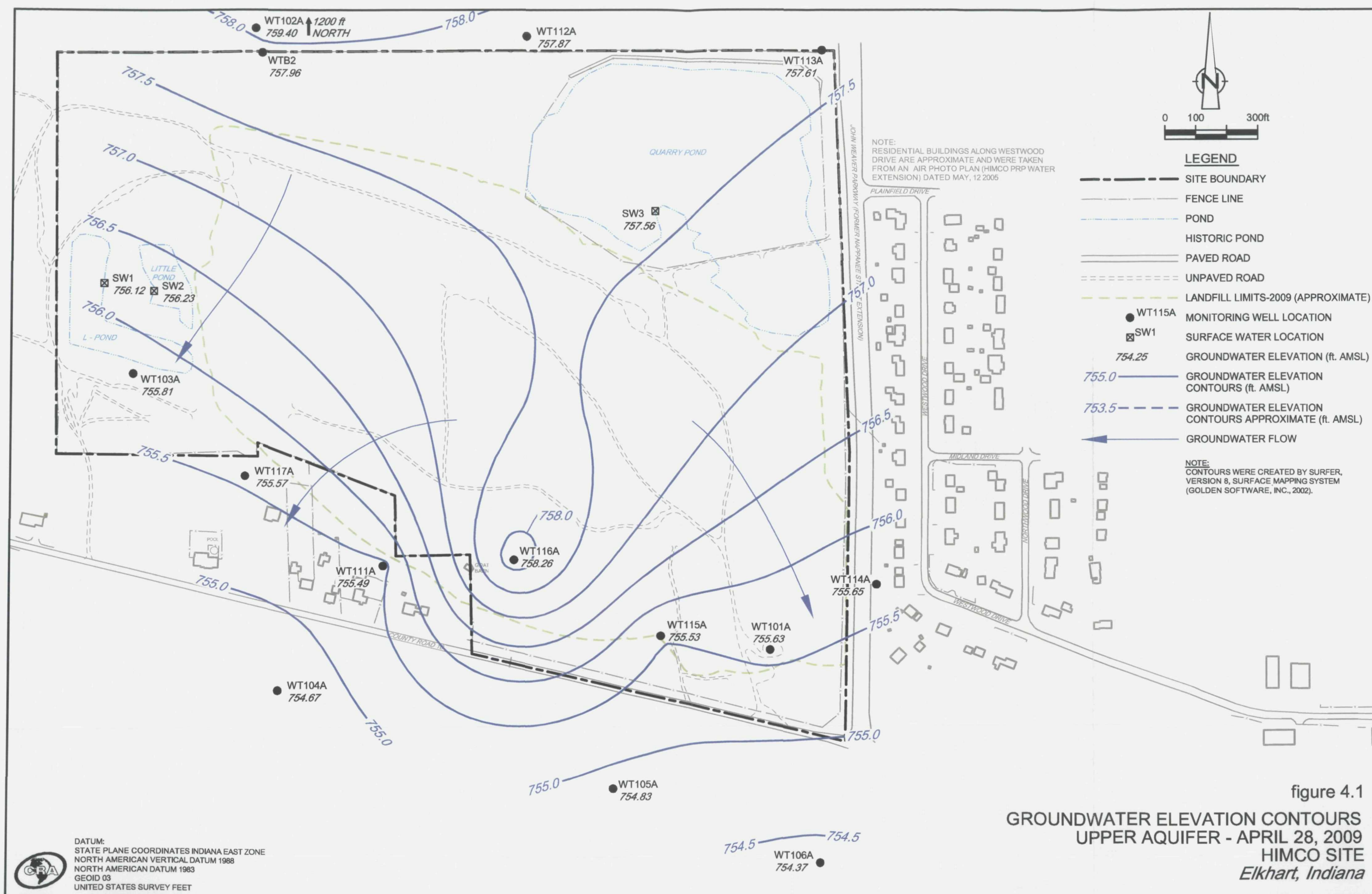
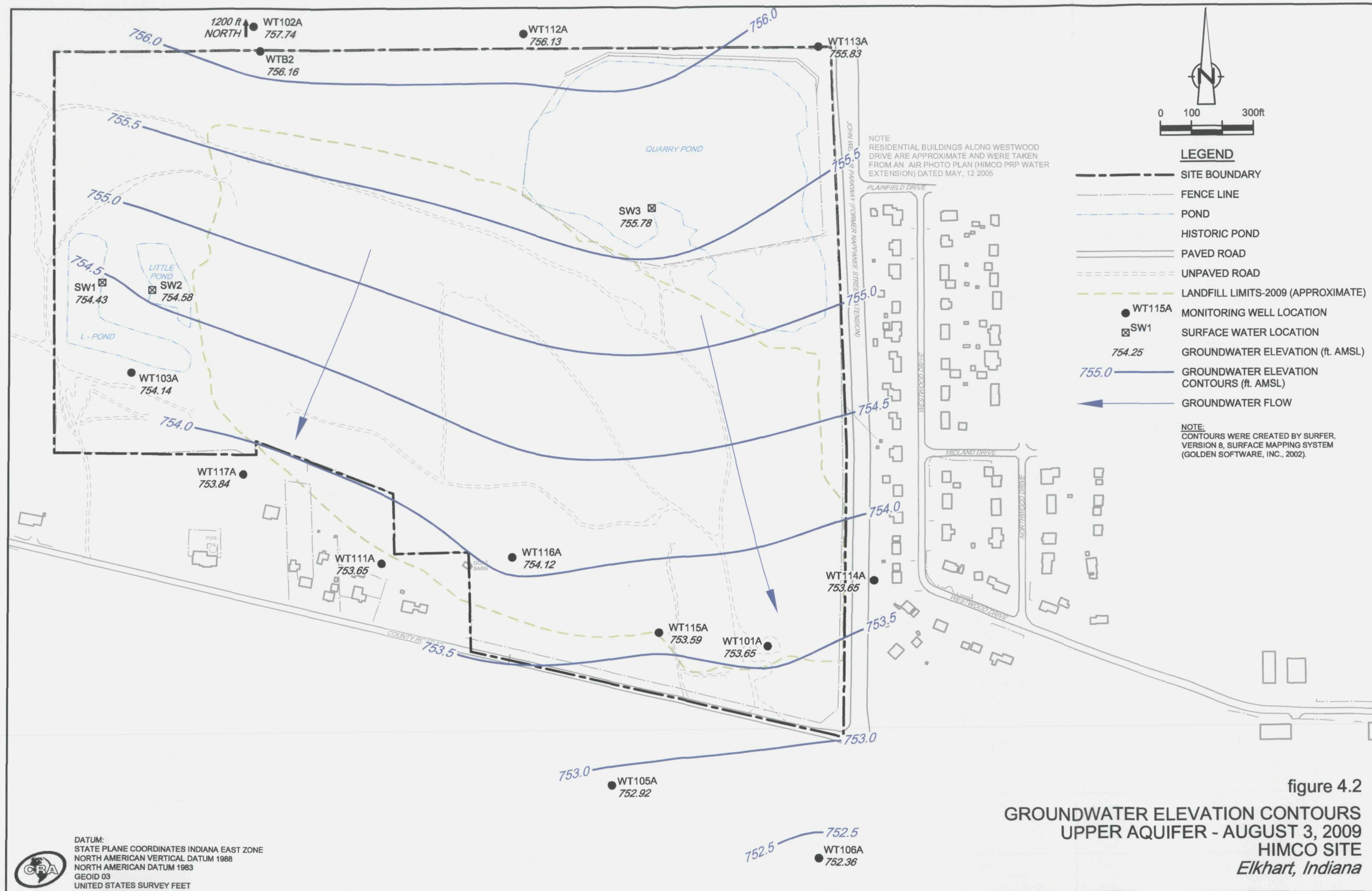
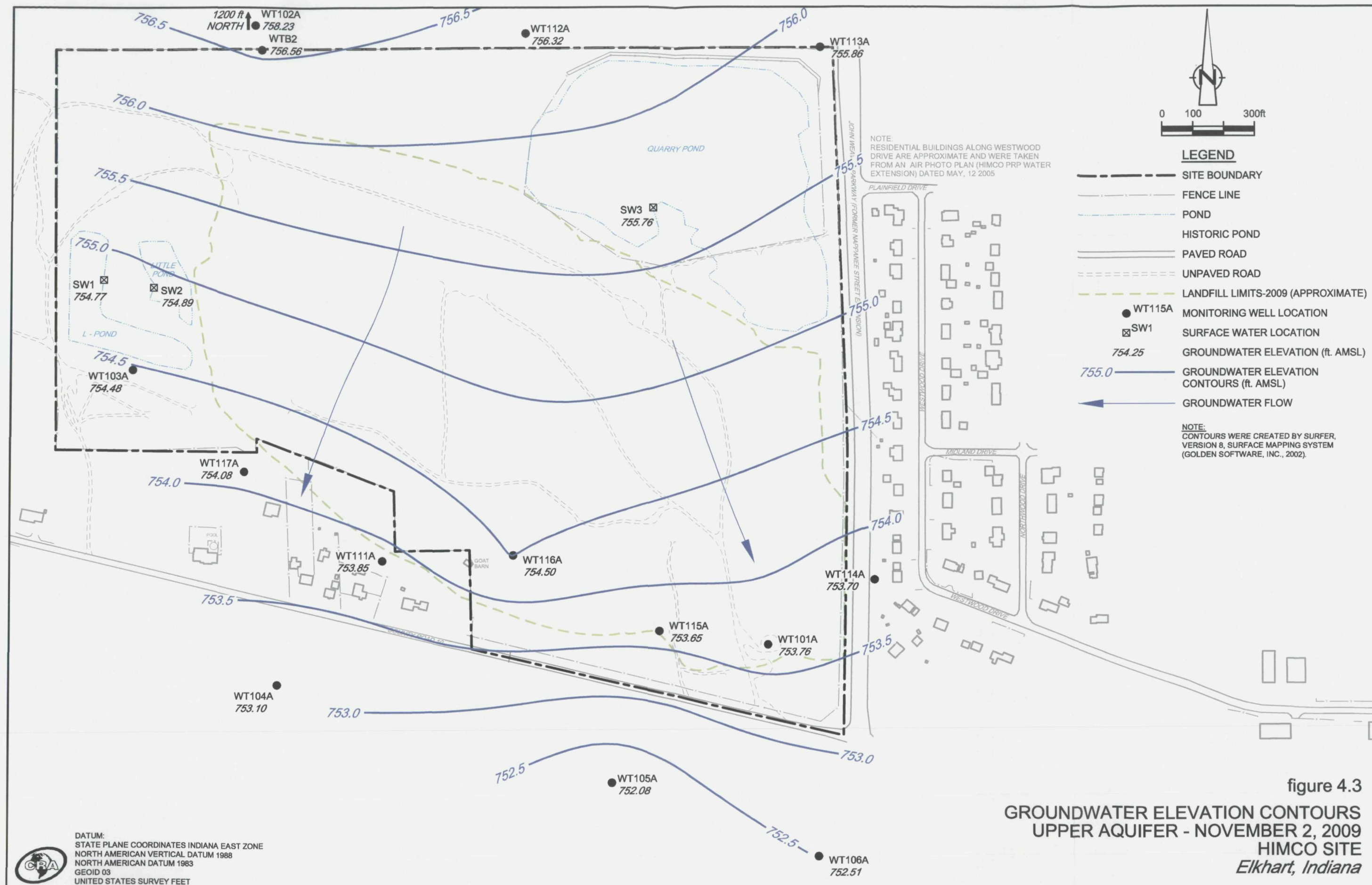
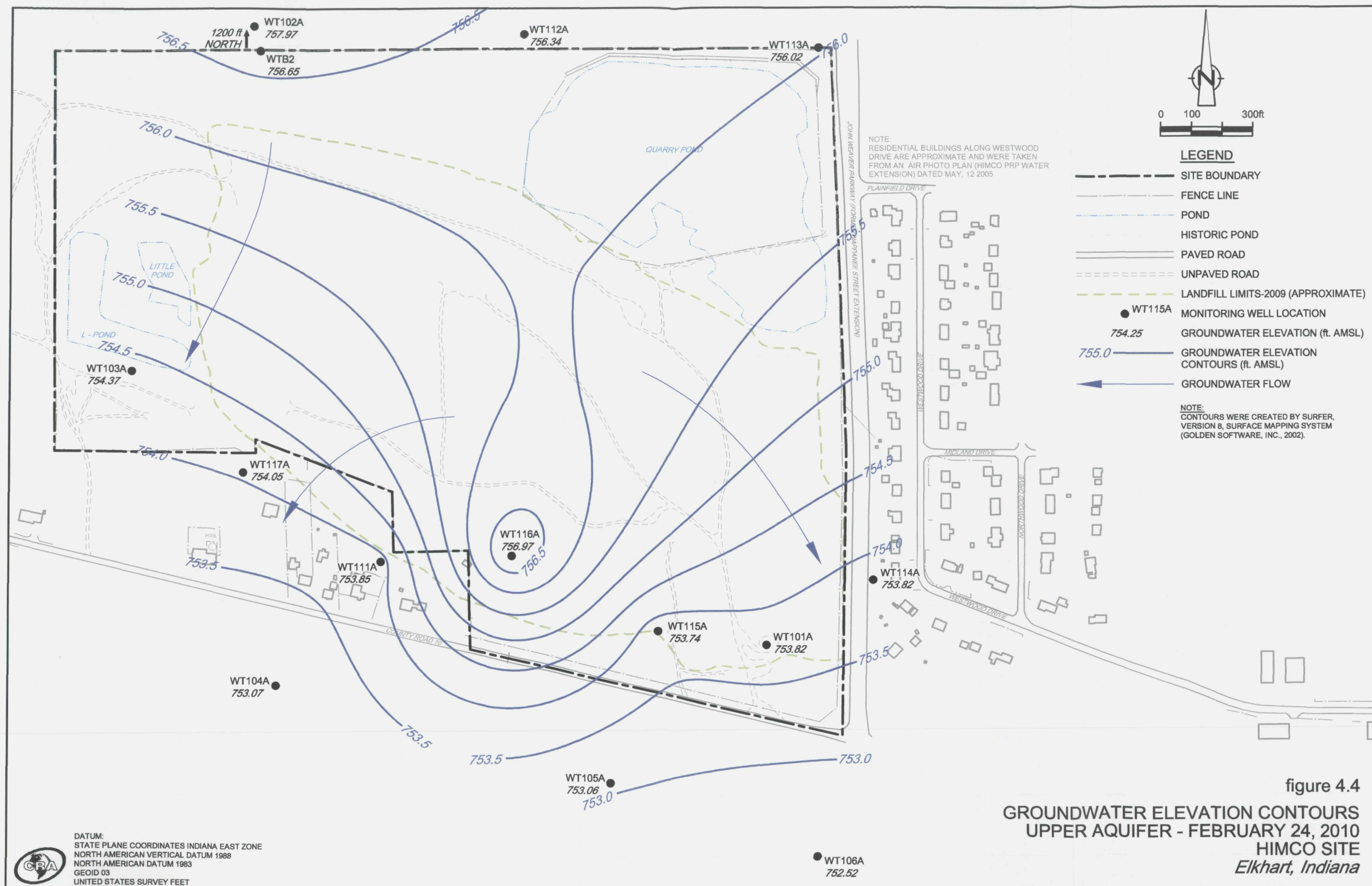


figure 4.1
GROUNDWATER ELEVATION CONTOURS
UPPER AQUIFER - APRIL 28, 2009
HIMCO SITE
Elkhart, Indiana







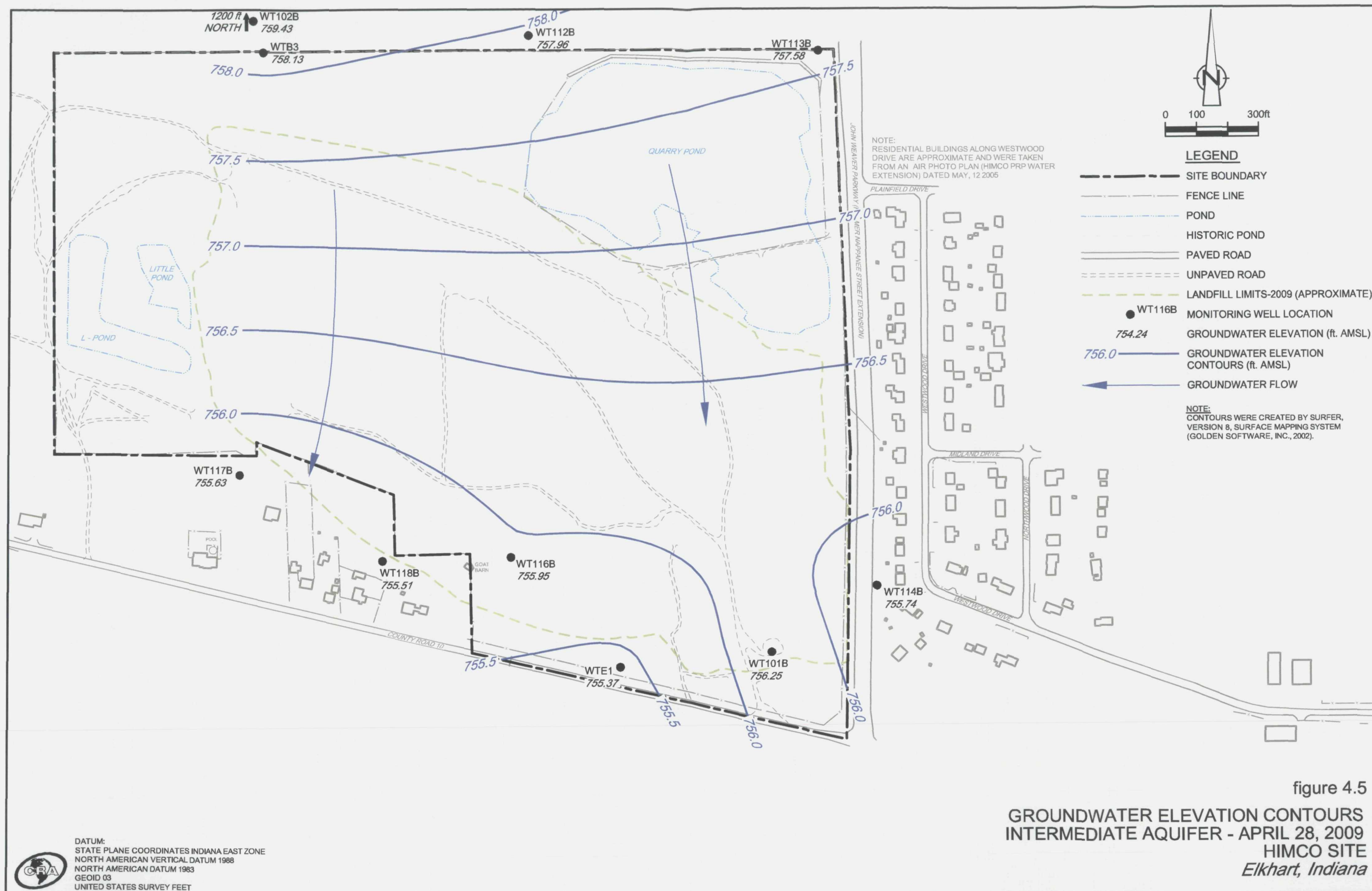


figure 4.5
GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE AQUIFER - APRIL 28, 2009
HIMCO SITE
Elkhart, Indiana

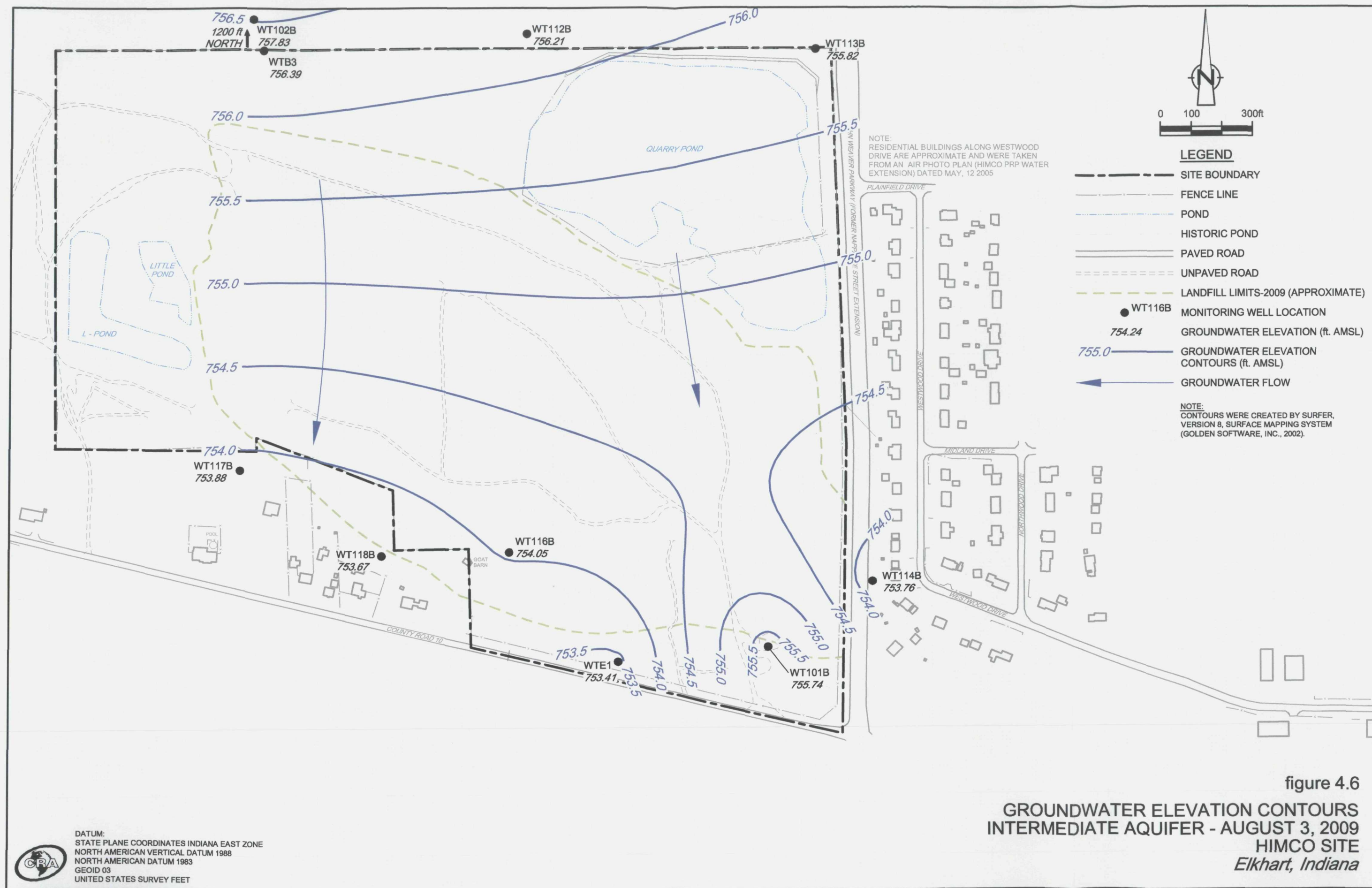
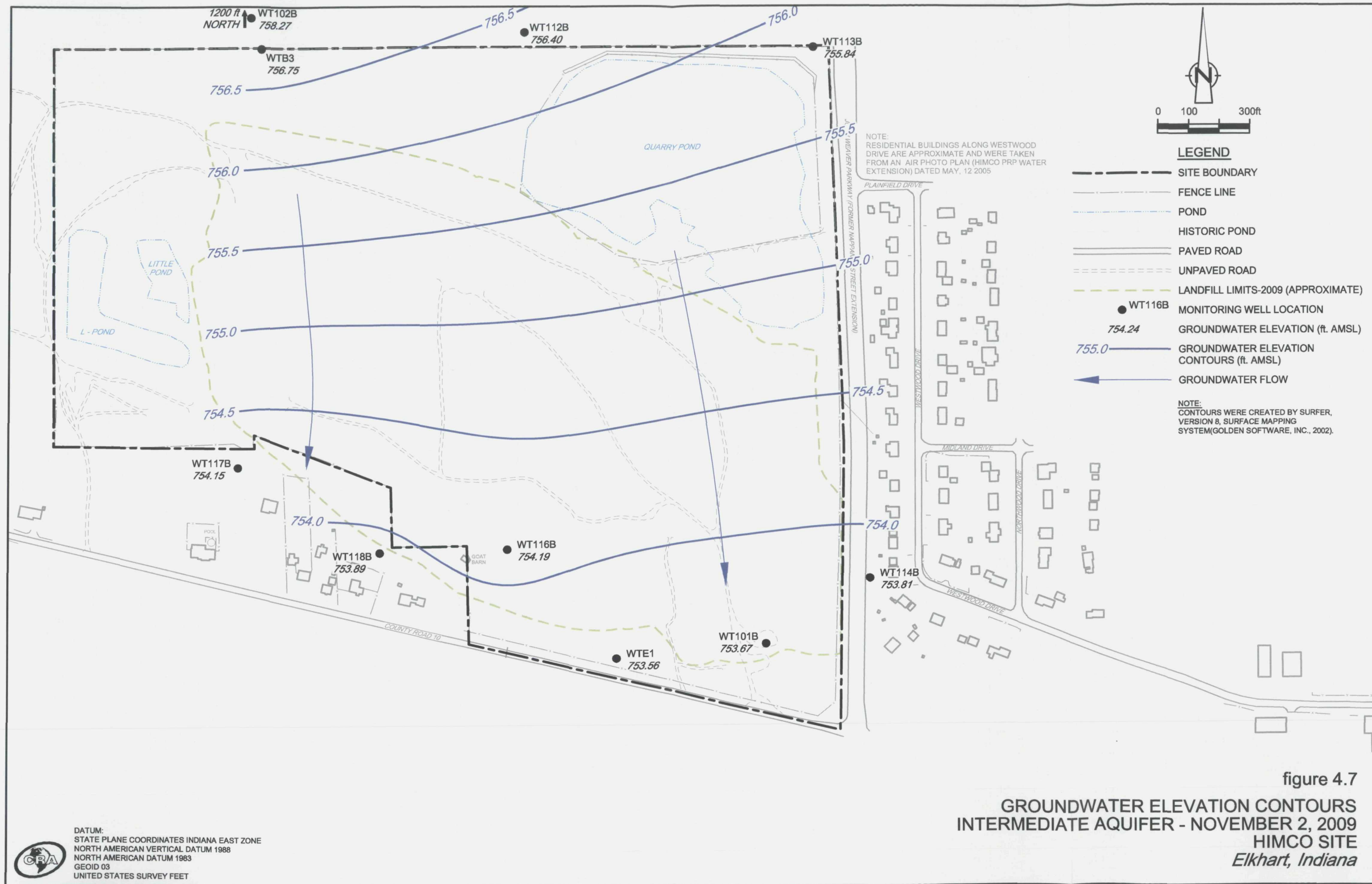


figure 4.6
GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE AQUIFER - AUGUST 3, 2009
HIMCO SITE
Elkhart, Indiana



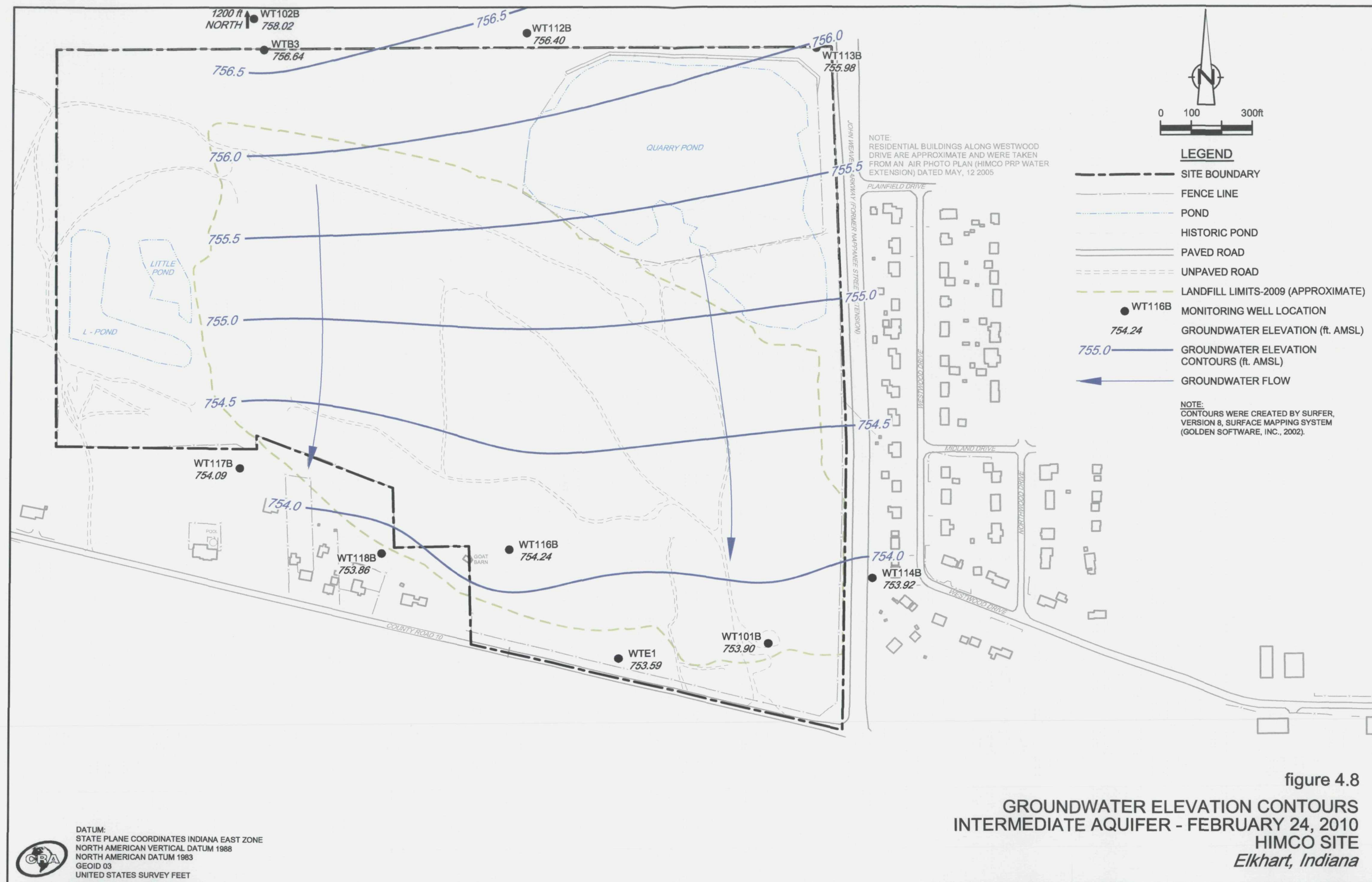
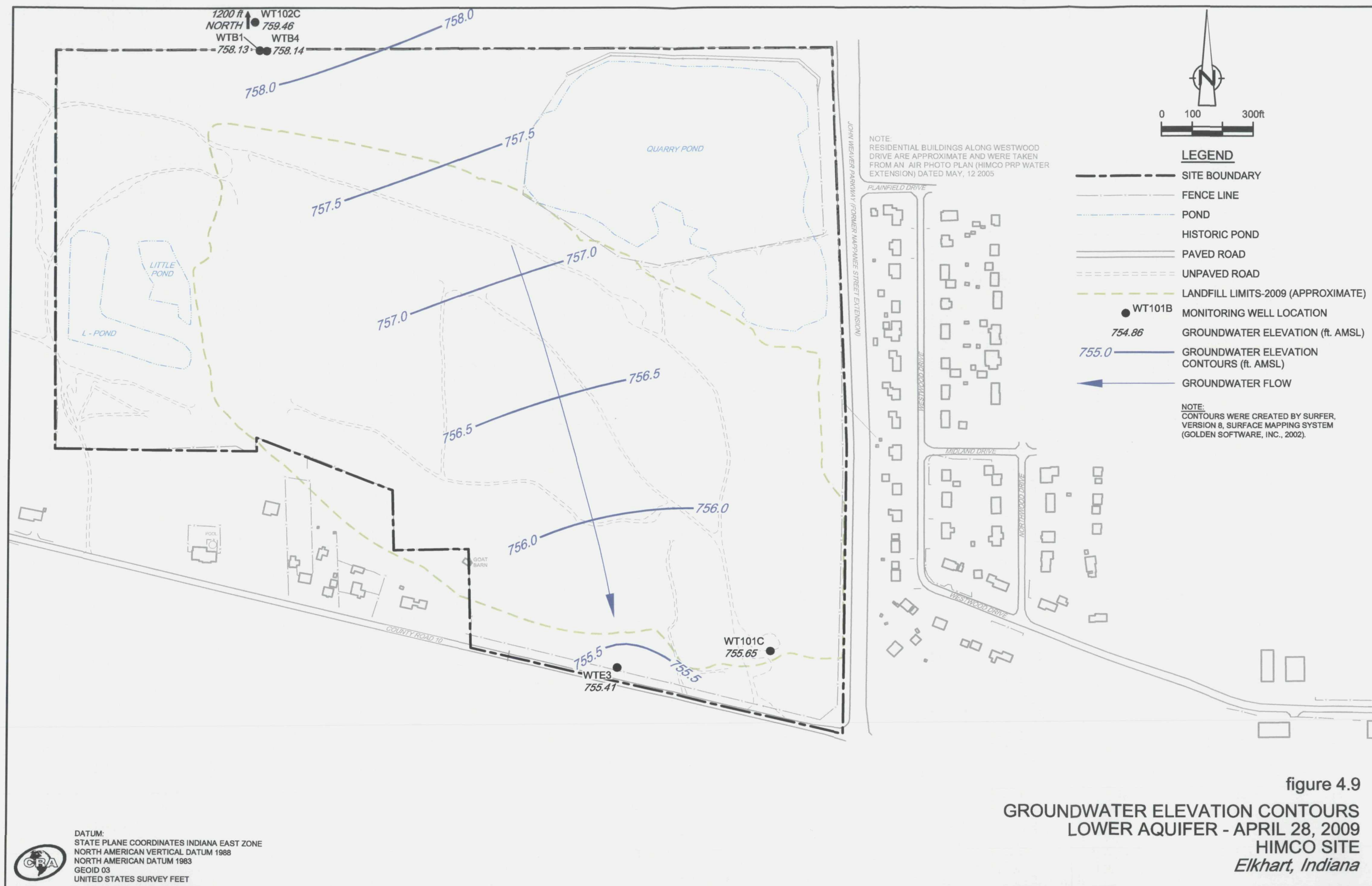


figure 4.8
GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE AQUIFER - FEBRUARY 24, 2010
HIMCO SITE
Elkhart, Indiana



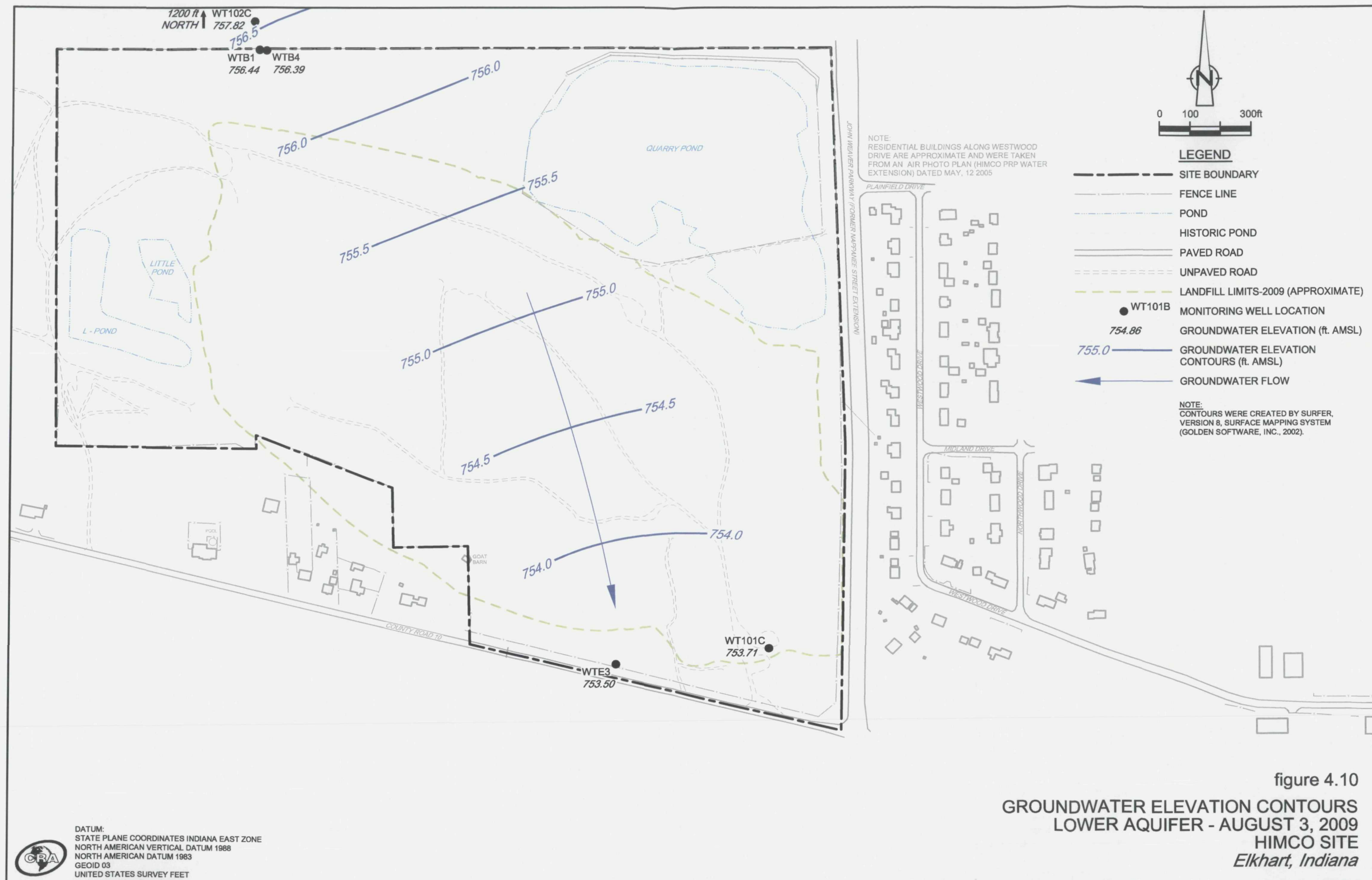


figure 4.10
GROUNDWATER ELEVATION CONTOURS
LOWER AQUIFER - AUGUST 3, 2009
HIMCO SITE
Elkhart, Indiana

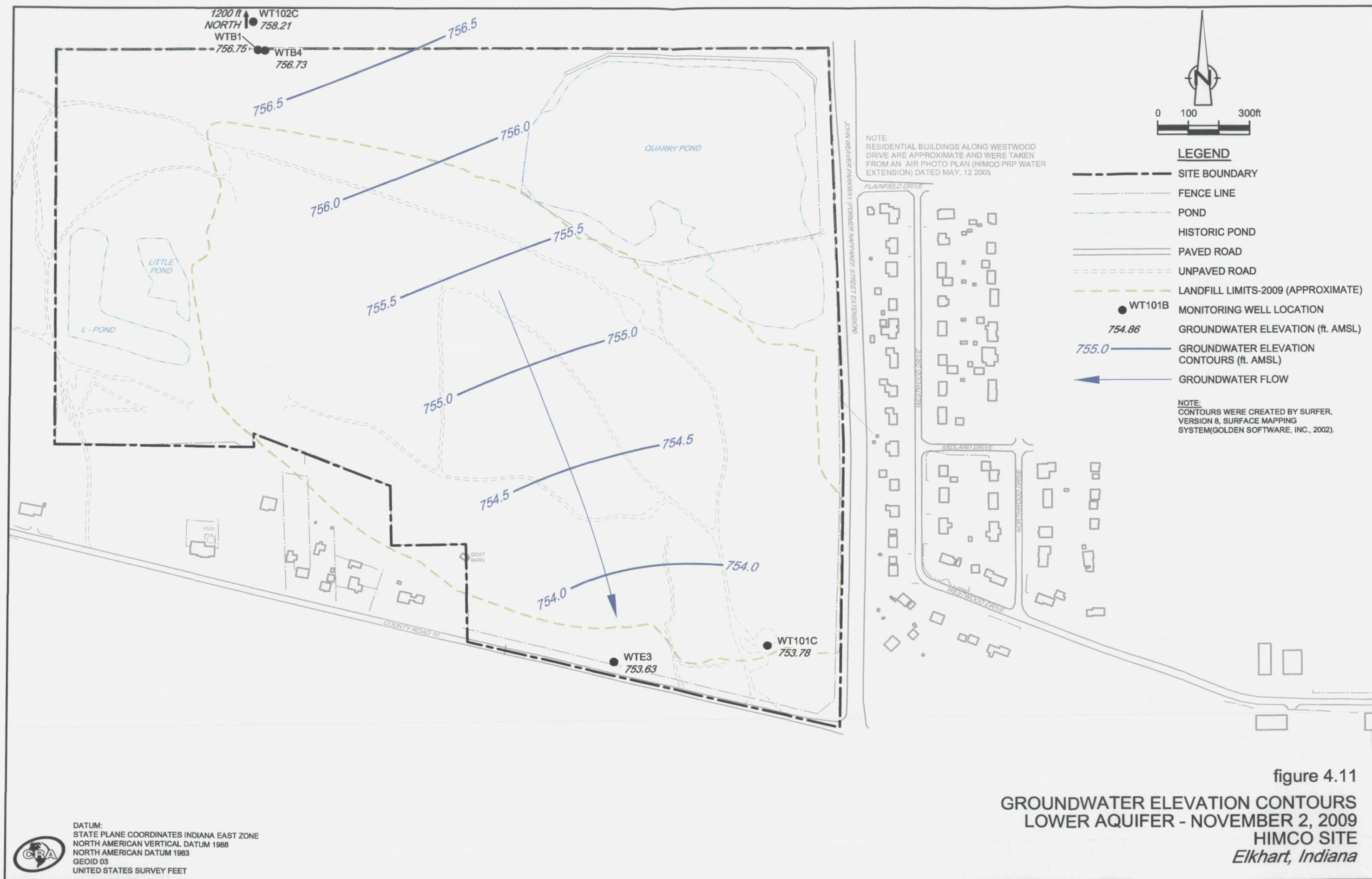


figure 4.11
GROUNDWATER ELEVATION CONTOURS
LOWER AQUIFER - NOVEMBER 2, 2009
HIMCO SITE
Elkhart, Indiana

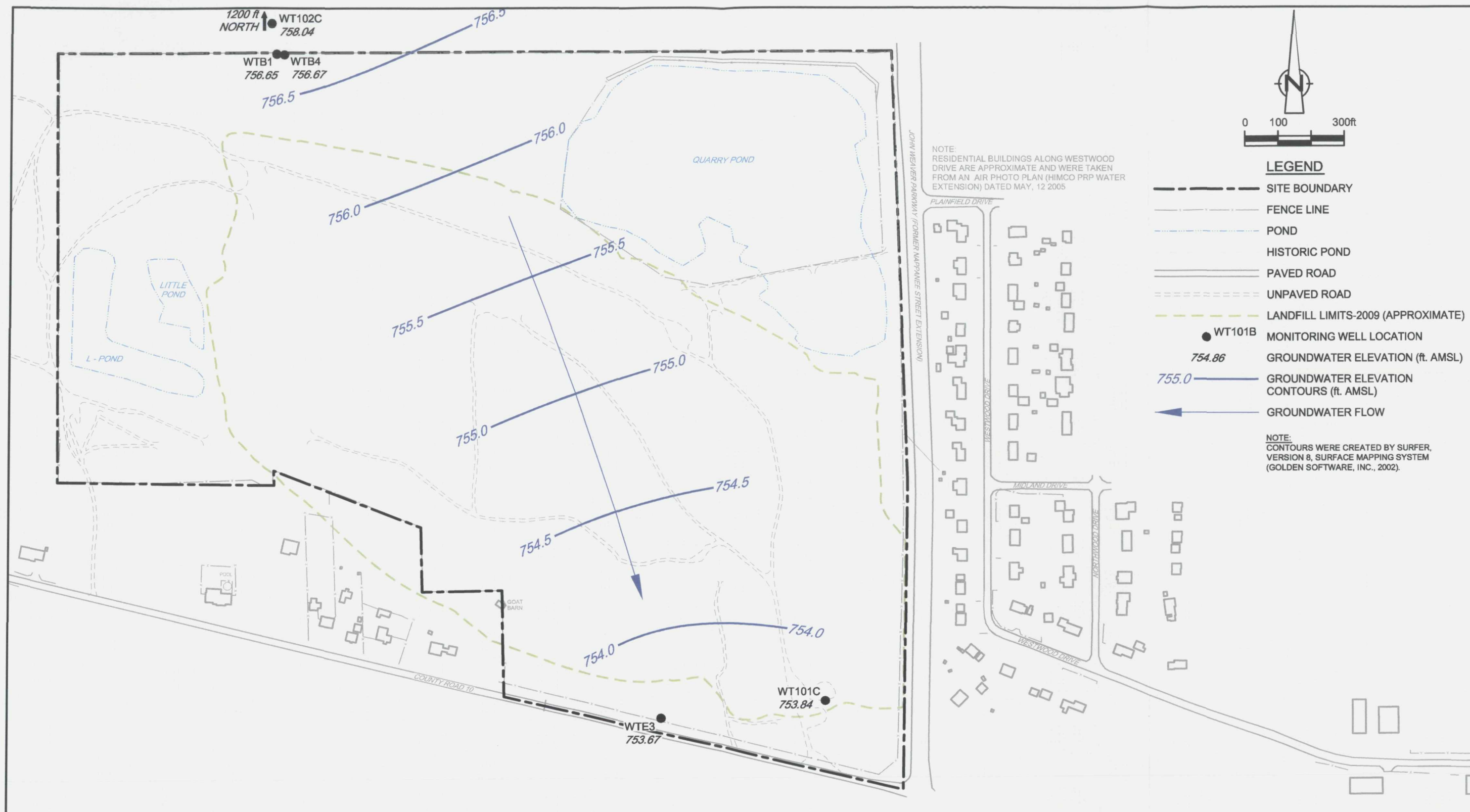


figure 4.12
GROUNDWATER ELEVATION CONTOURS
LOWER AQUIFER - FEBRUARY 24, 2010
HIMCO SITE
Elkhart, Indiana

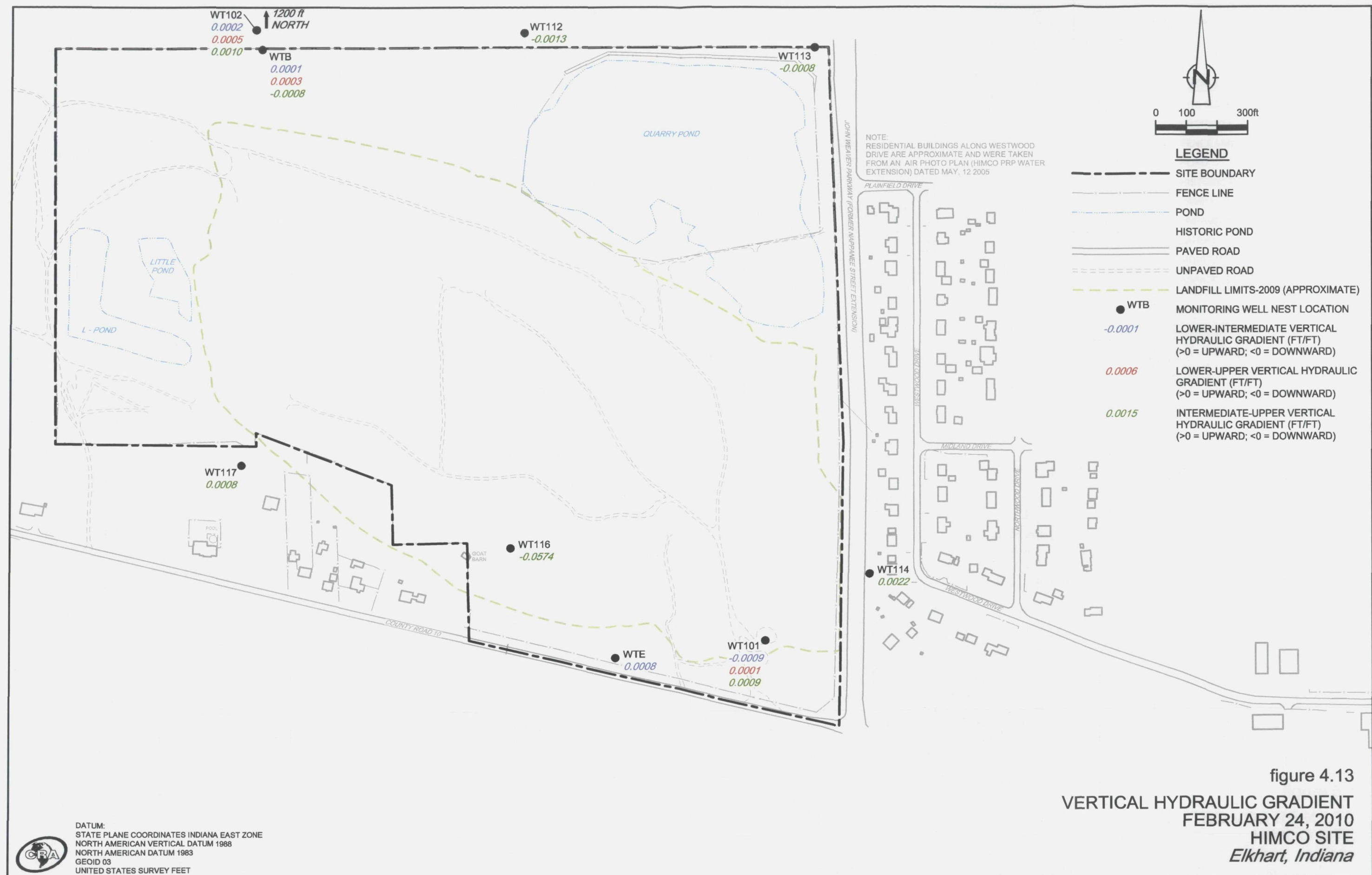


figure 4.13
VERTICAL HYDRAULIC GRADIENT
FEBRUARY 24, 2010
HIMCO SITE
Elkhart, Indiana

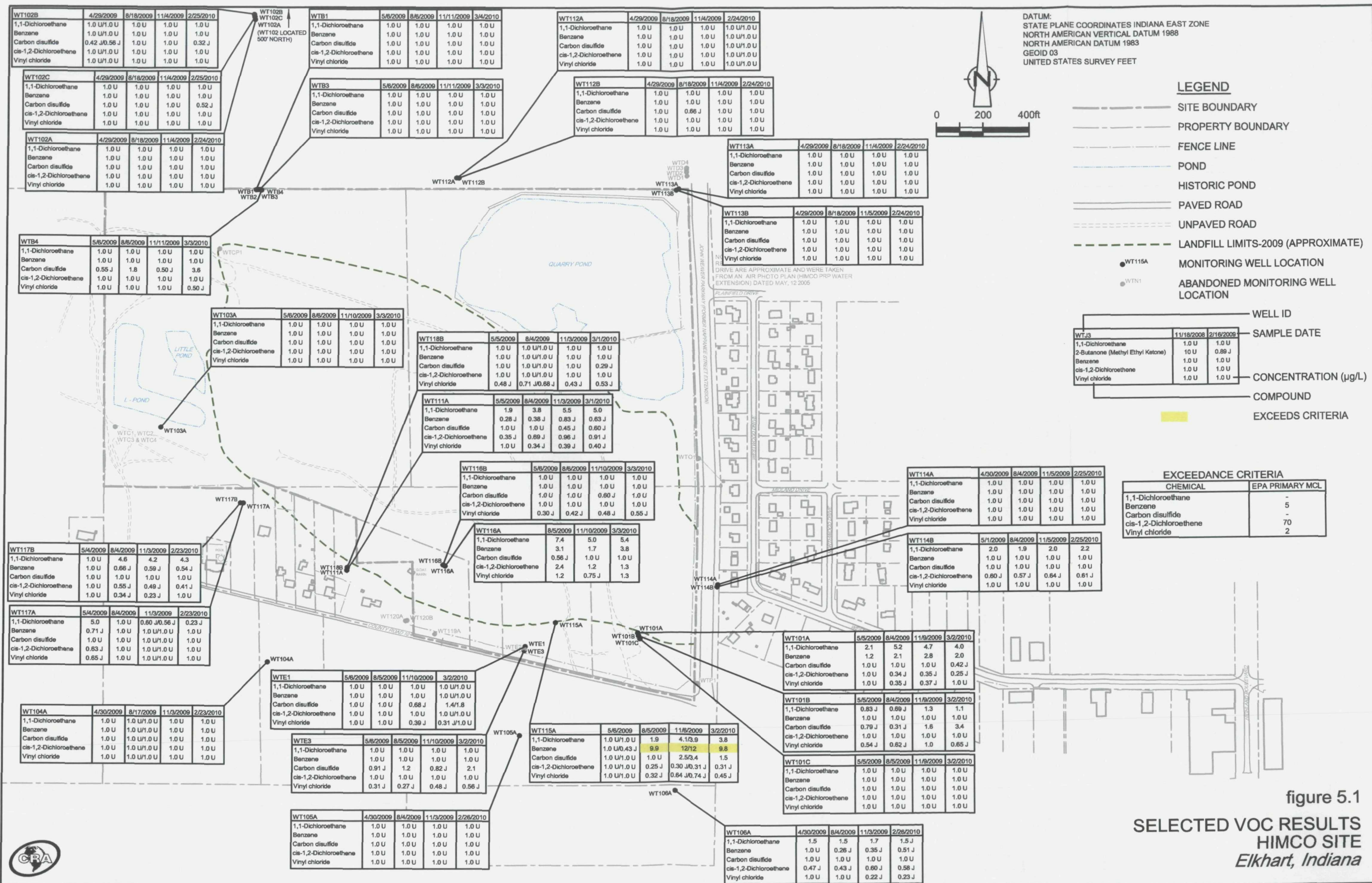




figure 5.2

BIS(2-ETHYLHEXYL)PHTHALATE RESULTS
HIMCO SITE
Elkhart, Indiana

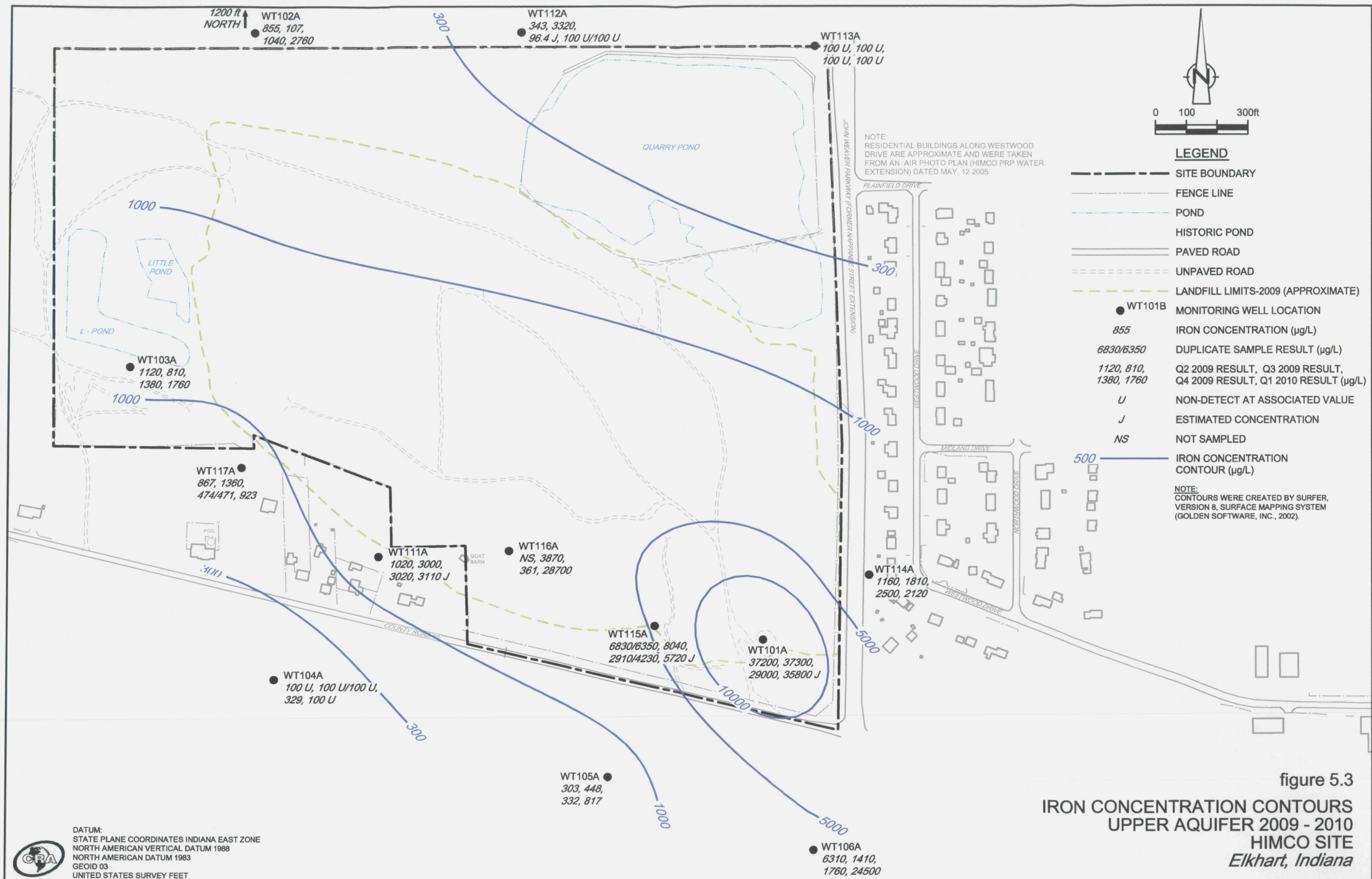


figure 5.3
IRON CONCENTRATION CONTOURS
UPPER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

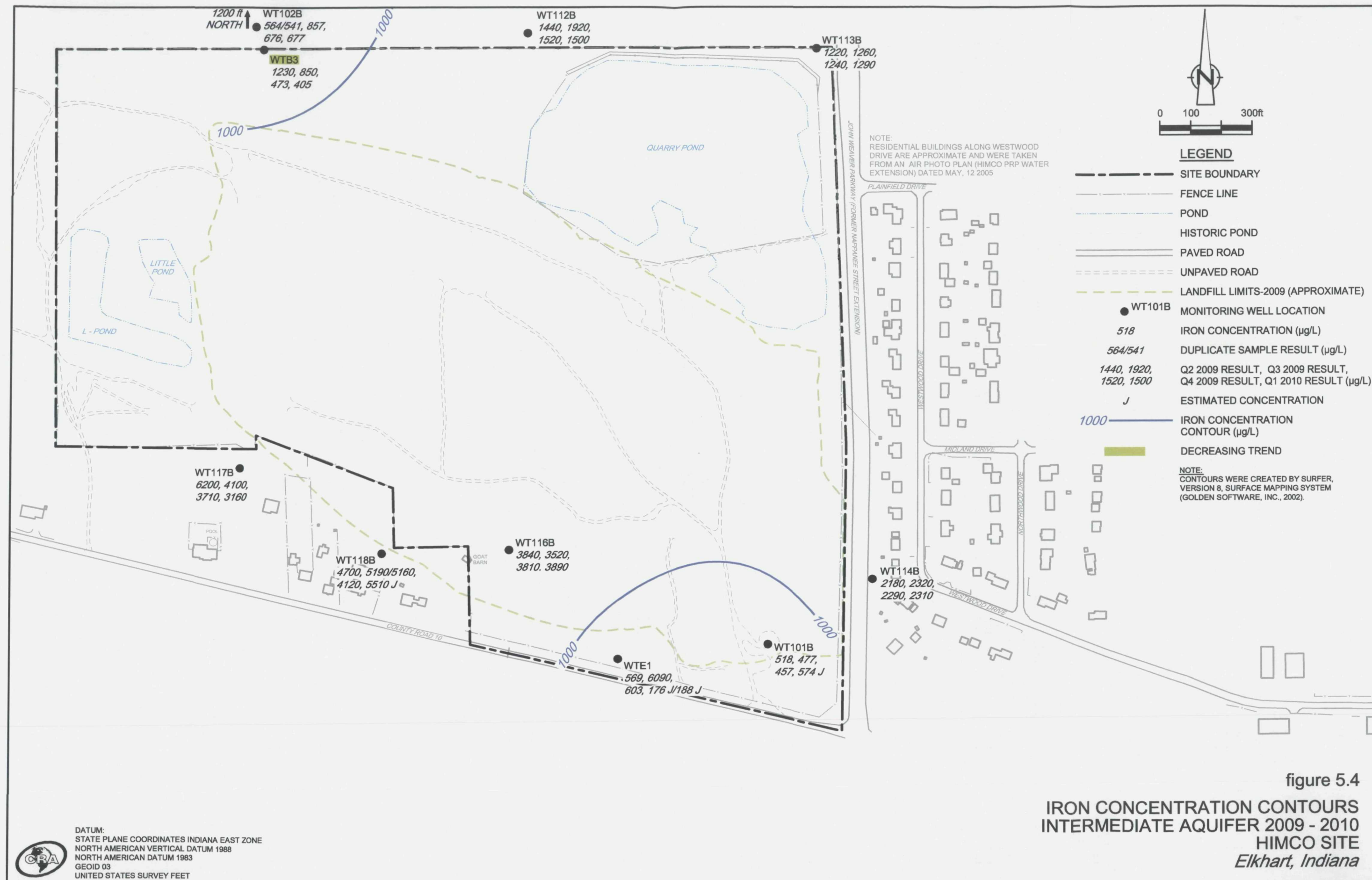


figure 5.4
IRON CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

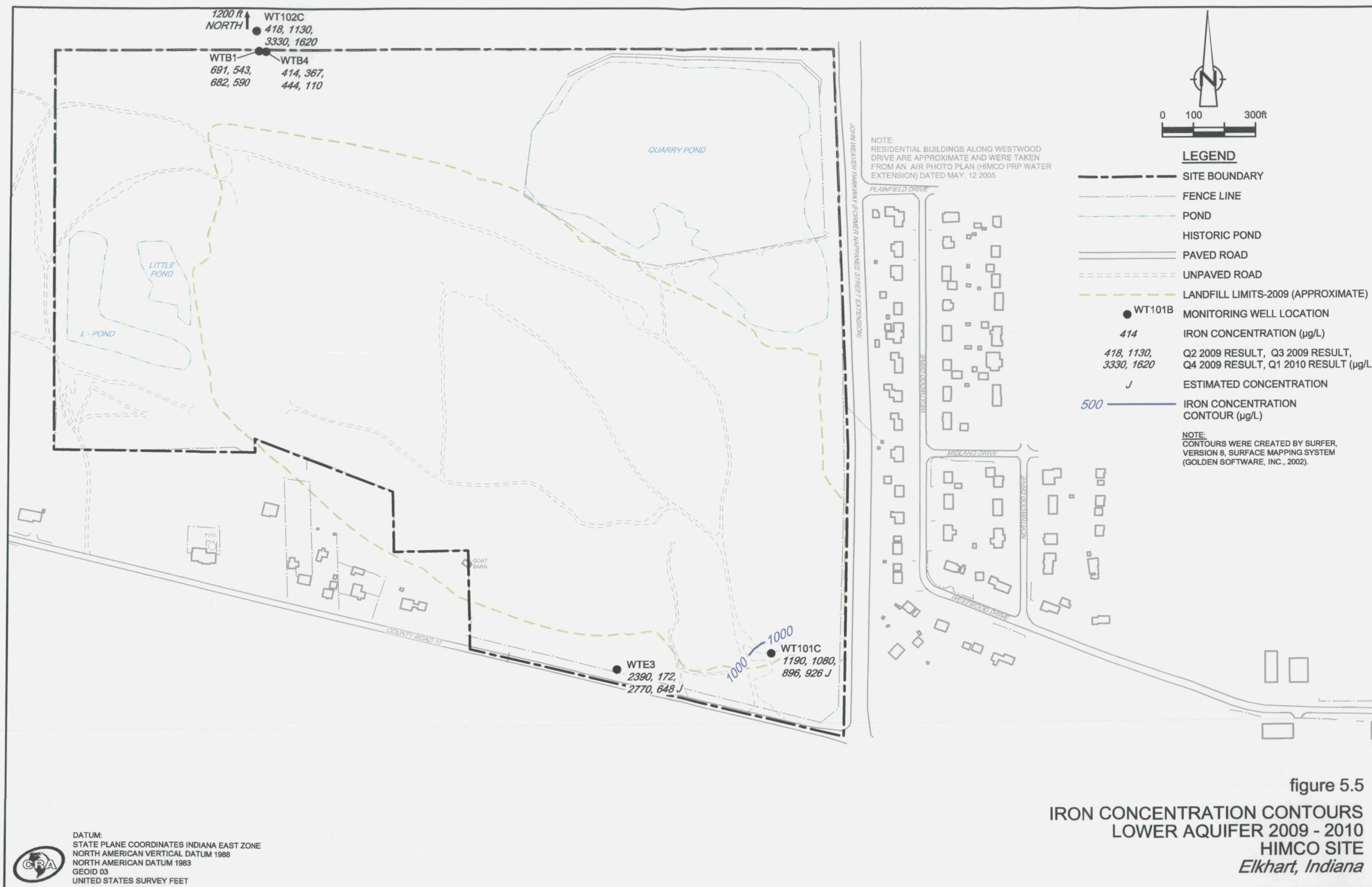


figure 5.5
IRON CONCENTRATION CONTOURS
LOWER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

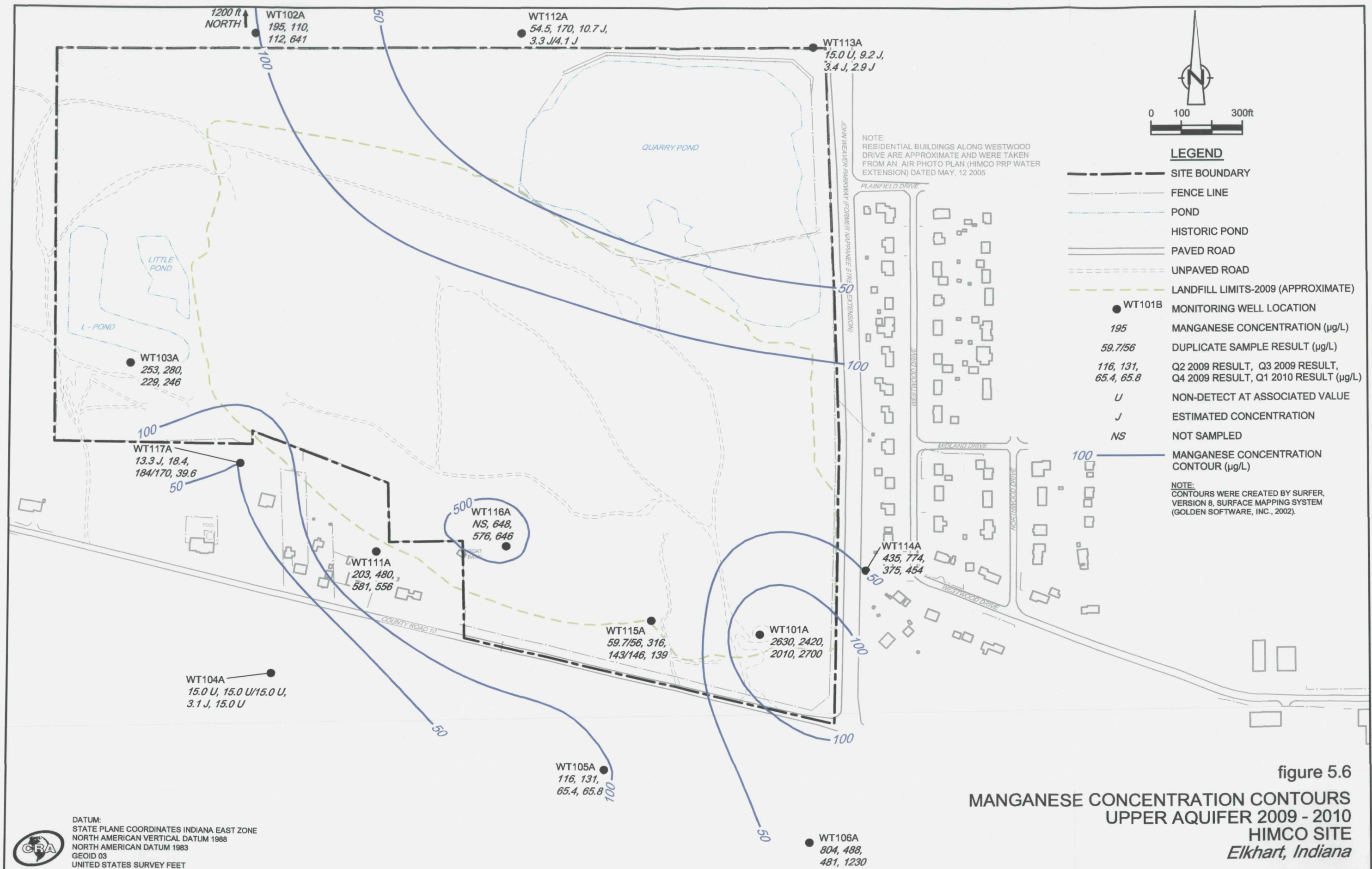


figure 5.6
MANGANESE CONCENTRATION CONTOURS
UPPER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

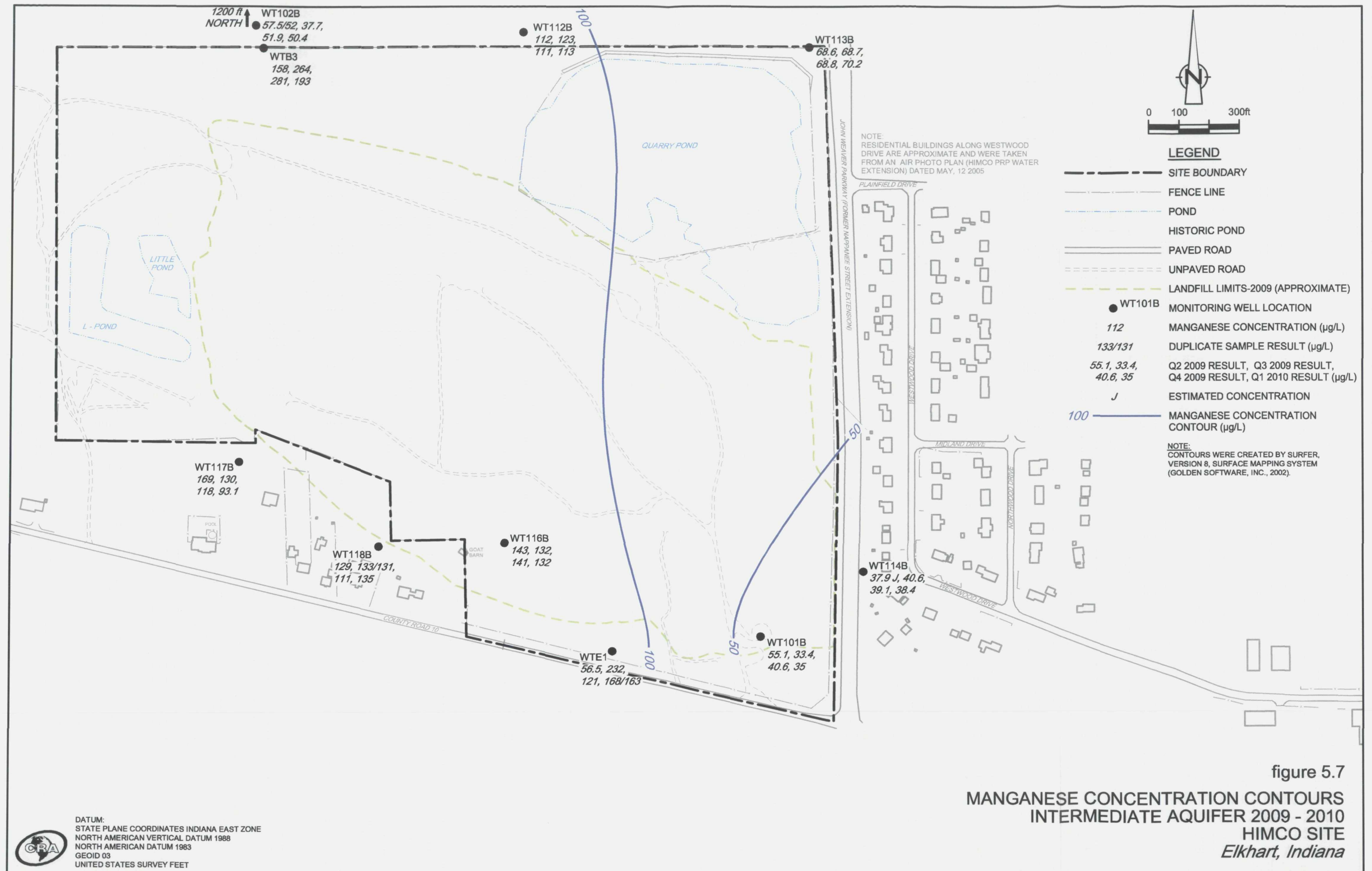


figure 5.7
MANGANESE CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

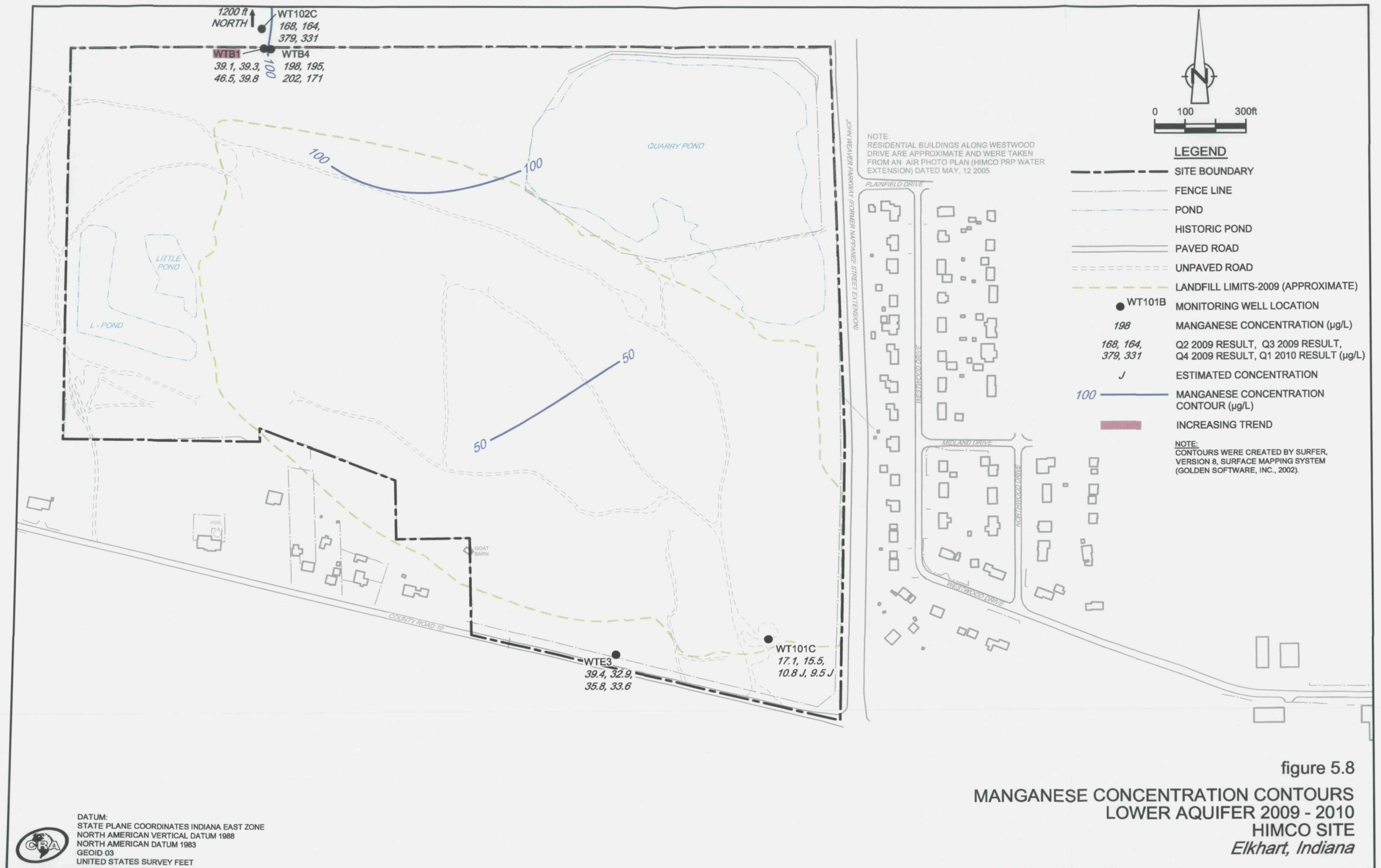


figure 5.8
MANGANESE CONCENTRATION CONTOURS
LOWER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

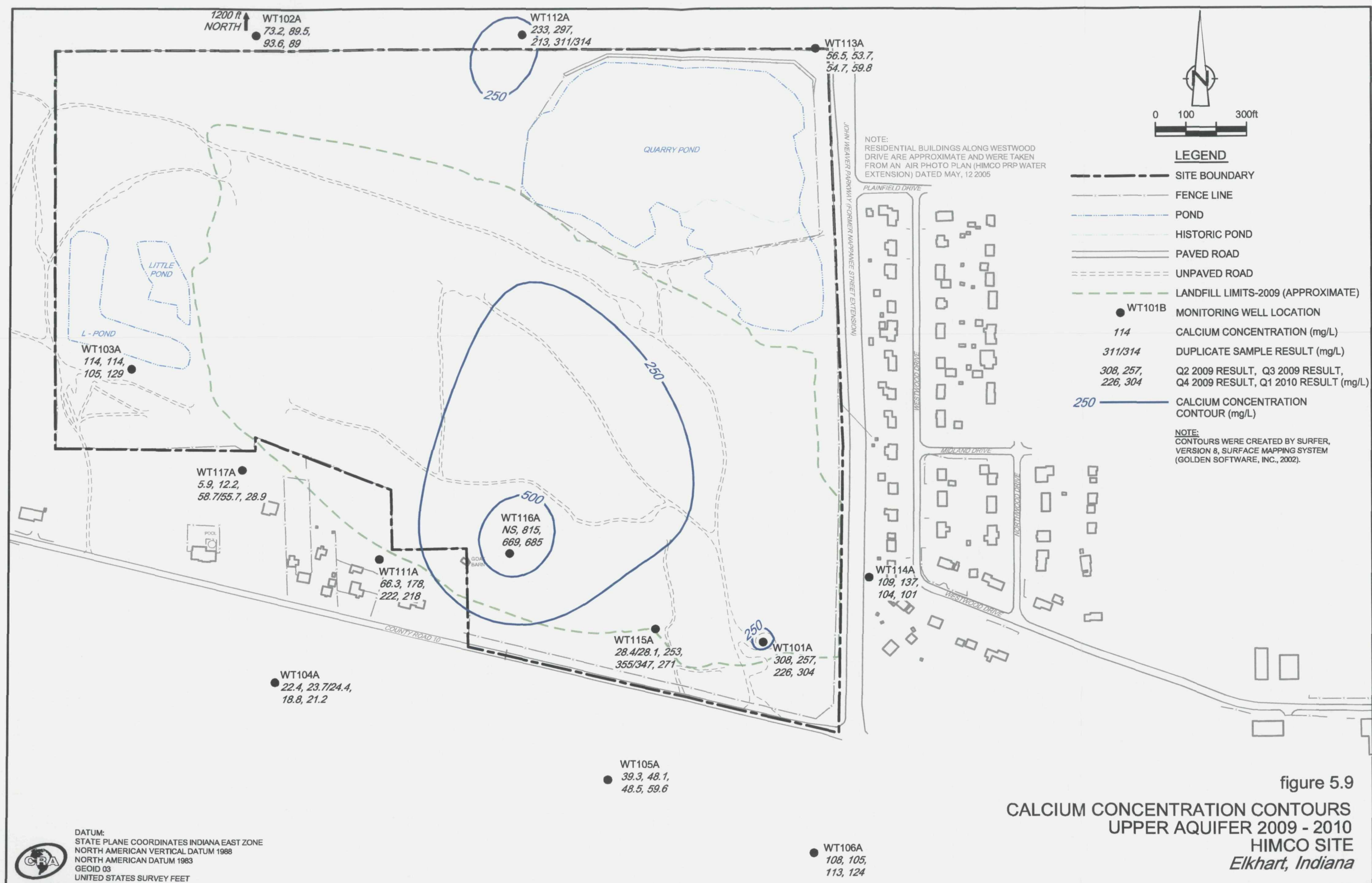


figure 5.9
CALCIUM CONCENTRATION CONTOURS
UPPER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

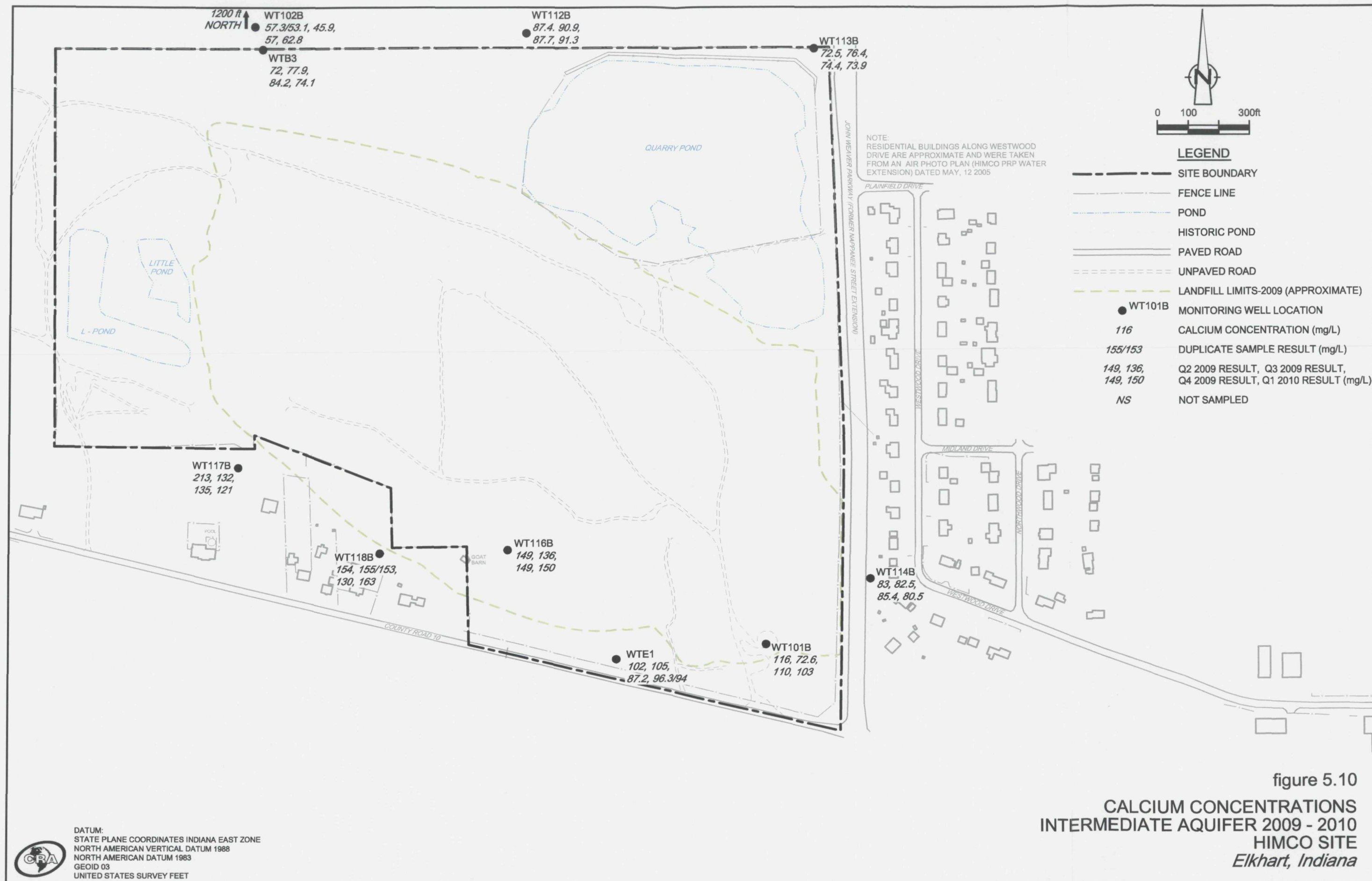
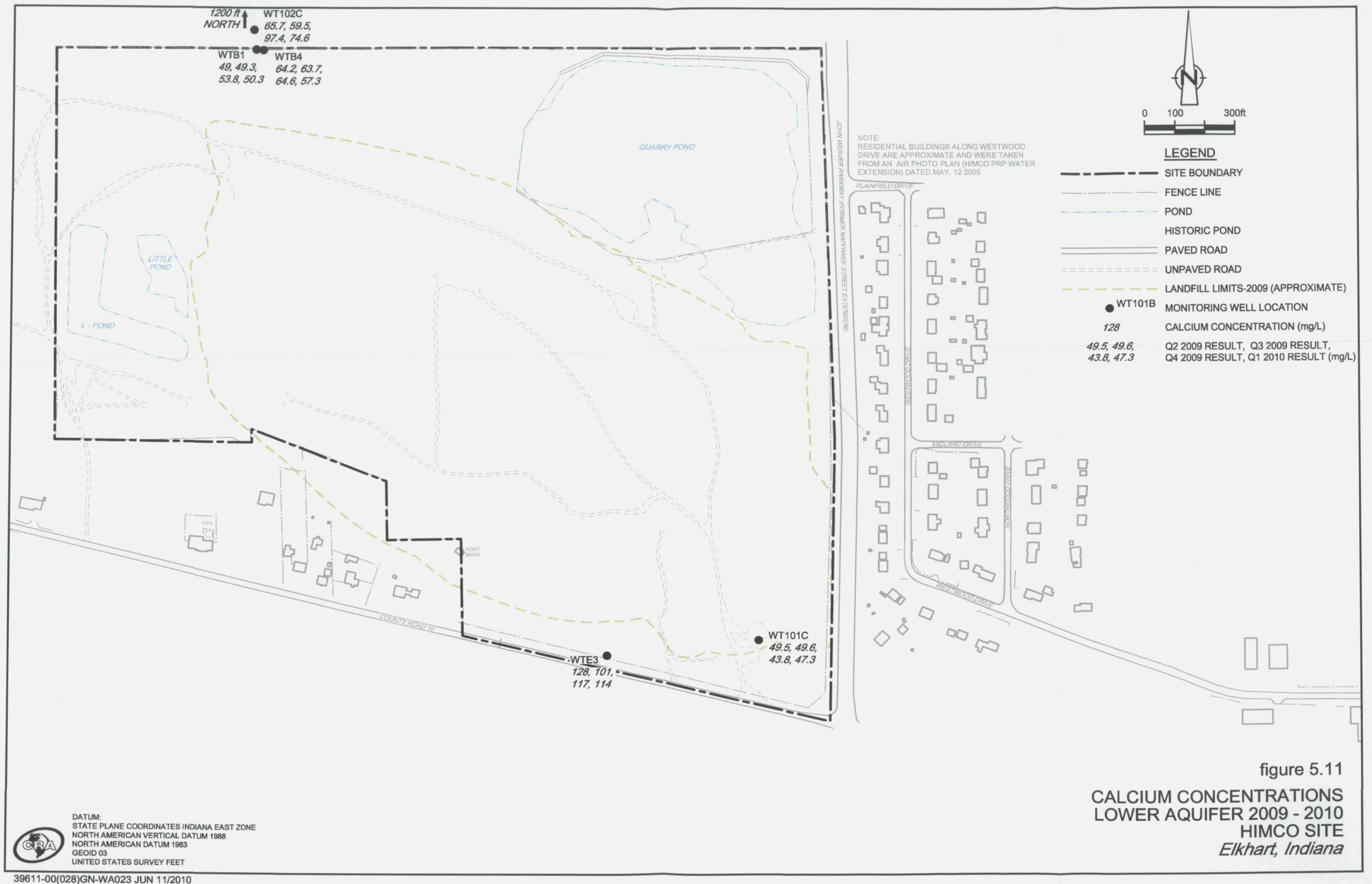


figure 5.10
CALCIUM CONCENTRATIONS
INTERMEDIATE AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana



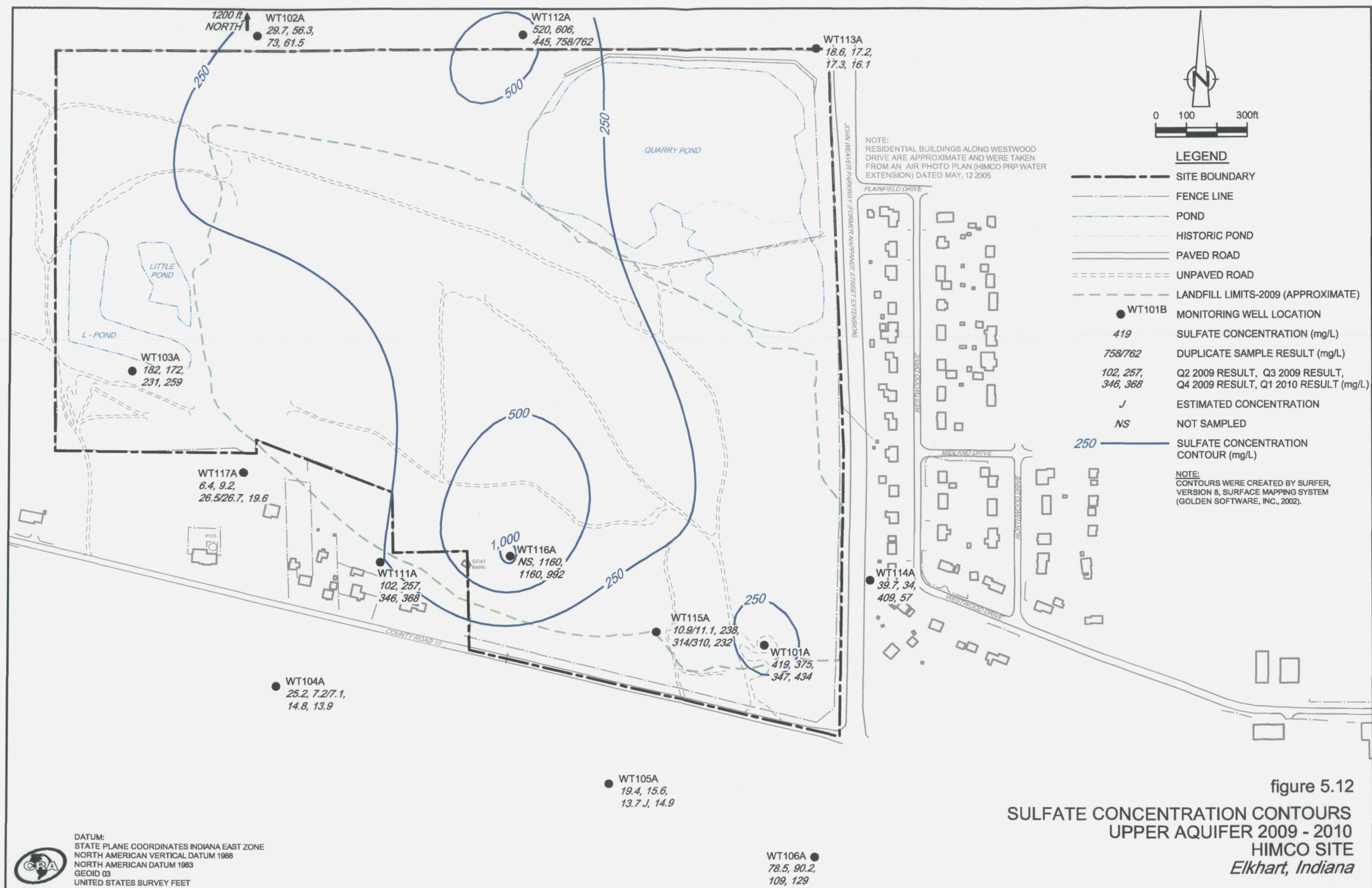


figure 5.12
SULFATE CONCENTRATION CONTOURS
UPPER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

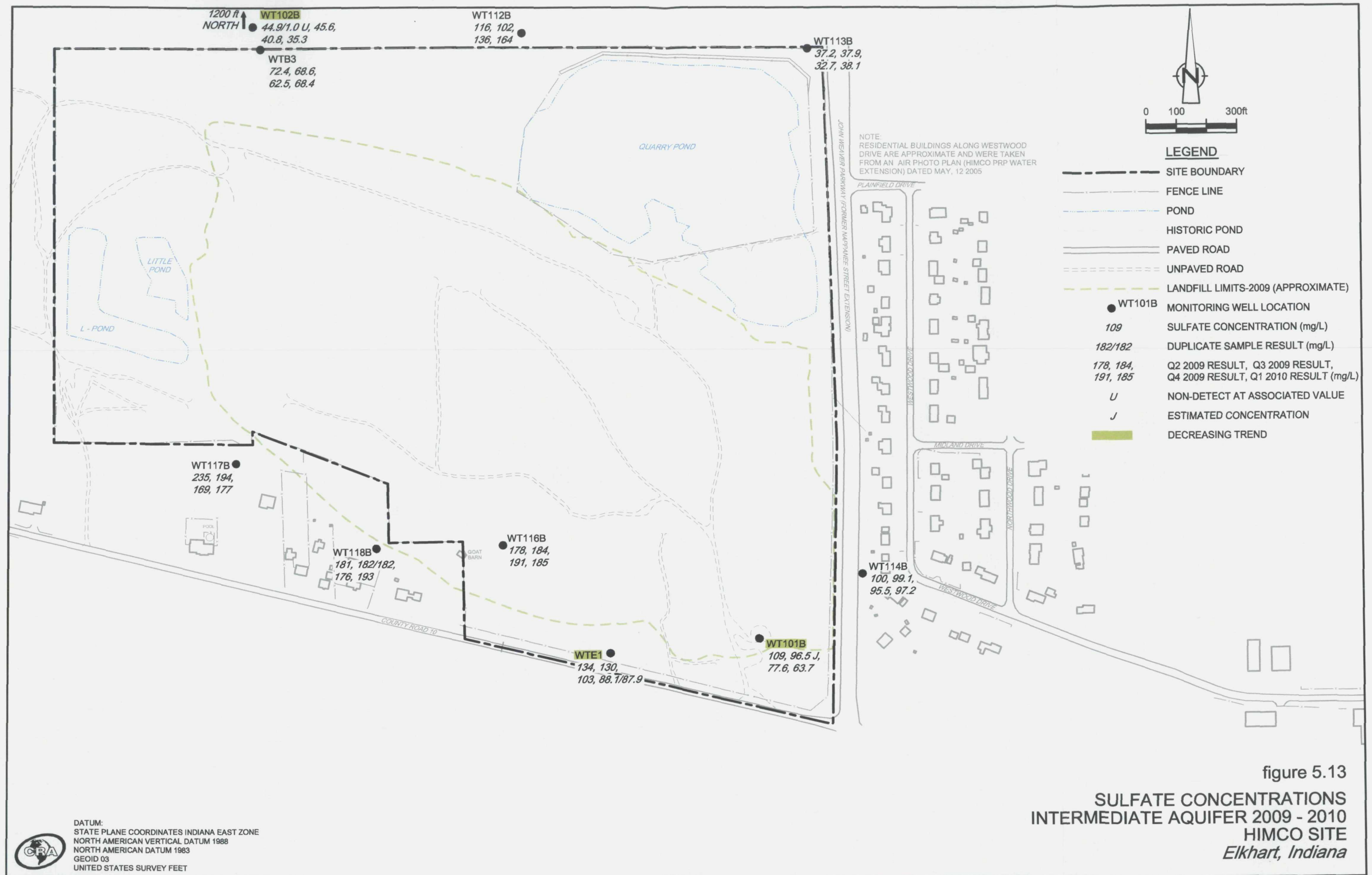


figure 5.13
SULFATE CONCENTRATIONS
INTERMEDIATE AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

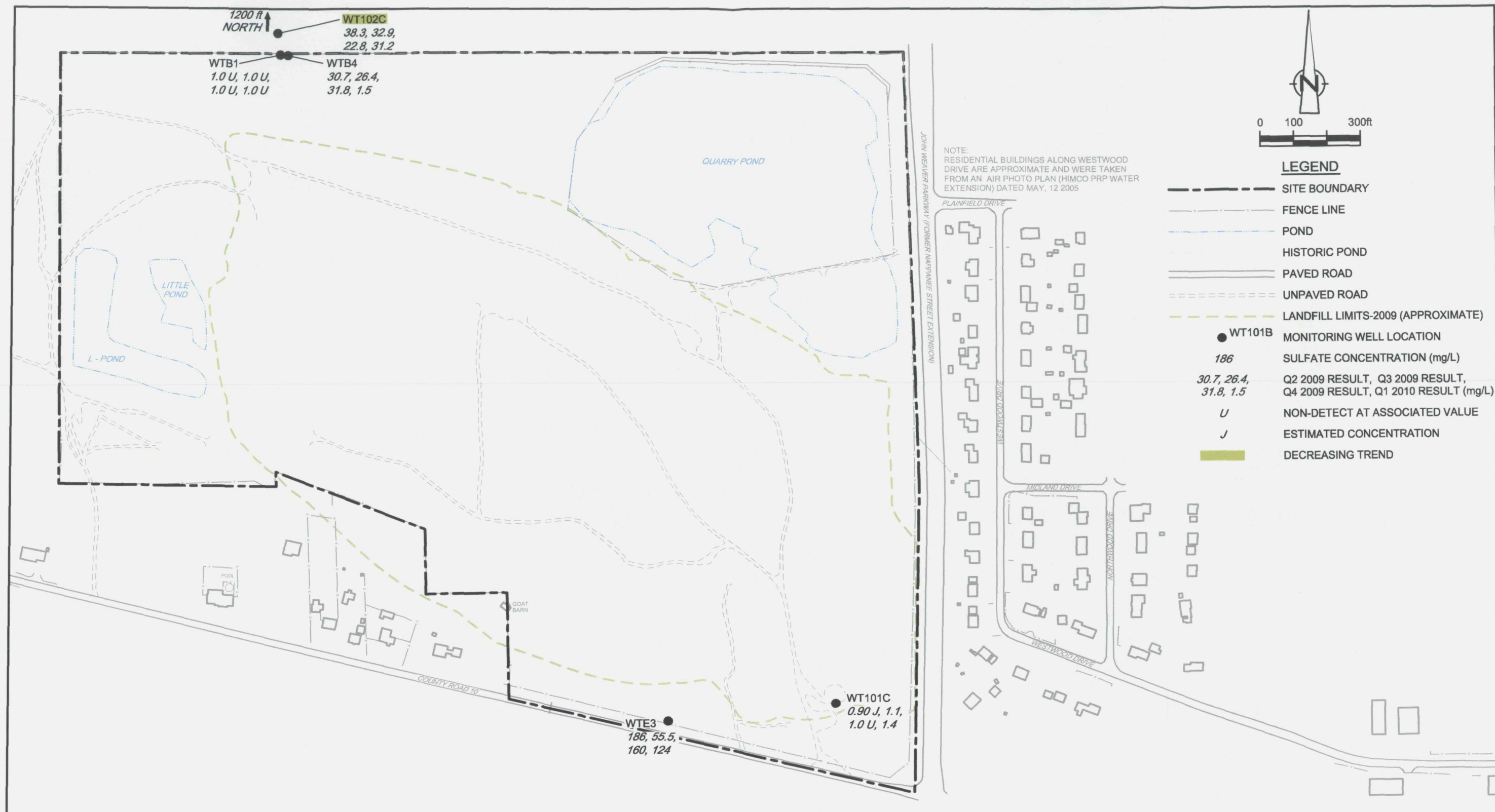


figure 5.14
SULFATE CONCENTRATIONS
LOWER AQUIFER 2009 - 2010
HIMCO SITE
Elkhart, Indiana

TABLES

TABLE 2.1
MONITORING WELL STATUS REPORT
HIMCO SITE
ELKHART, INDIANA

Well ID	Status	Installation Date	Screen Length (ft)	Material	Casing Diameter (inches)	Installed Depth (ft bgs)	Reference Elevation (ft AMSL)	Ground Surface (ft AMSL)	Top of Well Screen (ft AMSL)	Bottom of Well Screen (ft AMSL)	Aquifer Designation	Northing	Easting
UPPER AQUIFER WELLS (760 - 710 ft AMSL)													
WT101A	Functional	11/12/1990	10.00	Stainless Steel	2	16.3	763.87	761.53	755.23	745.23	Upper	2351887.26	235722.25
WT102A	Functional	11/10/1990	10.00	Stainless Steel	2	16.0	768.50	766.19	760.19	750.19	Upper	2355111.73	234055.37
WT103A	Functional	11/11/1990	10.00	Stainless Steel	2	16.0	760.11	757.60	751.60	741.60	Upper	2352799.65	233645.99
WT104A	Functional	11/12/1990	10.00	Stainless Steel	2	16.3	765.01	762.32	756.02	746.02	Upper	2351753.99	234123.86
WT105A	Functional	11/10/1990	10.00	Stainless Steel	2	16.0	762.37	760.07	754.07	744.07	Upper	2351430.59	235211.48
WT106A	Functional	11/9/1990	10.00	Stainless Steel	2	16.3	760.63	758.46	752.16	742.16	Upper	2351184.52	235885.61
WT111A	Functional	9/10/1991	10.00	Stainless Steel	2	20.0	766.00	764.30	754.30	744.30	Upper	2352165.35	234465.00
WT112A	Functional	8/23/1995	10.00	PVC	2	15.4	765.28	763.71	758.31	748.31	Upper	2353912.48	234933.96
WT113A	Functional	8/10/1995	10.00	PVC	2	21.7	771.27	769.32	757.62	747.62	Upper	2353866.00	235898.24
WT114A	Functional	8/21/1995	10.00	PVC	2	22.0	768.62	766.82	754.82	744.82	Upper	2352102.29	236069.62
WT115A	Functional	8/22/1995	10.00	PVC	2	17.4	765.48	763.28	755.88	745.88	Upper	2351932.43	235367.05
WT116A	Functional	8/17/1995	10.00	PVC	2	12.6	763.35	761.30	758.70	748.70	Upper	2352184.92	234891.00
WT117A	Functional	8/15/1995	10.00	PVC	2	15.5	766.70	764.66	759.16	749.16	Upper	2352463.27	234015.45
WT119A	Damaged	10/14/1998	10.00	PVC	2	17.5		Not Surveyed			Upper	Not Surveyed	
WTB2	Functional	11/3/1977	10.00	Black Steel	2	11.9	762.70	760.82	758.92	748.92	Upper	2353858.07	234068.99
WTJ1	Functional	10/12/1977	5.00	PVC	5	40.0	755.65	753.43	718.43	713.43	Upper	2349819.96	238638.18
WTJ2	Damaged	11/2/1977	10.00	Black Steel	2	17.8	753.74	753.32	745.52	735.52	Upper	2349819.43	238645.44
WTK2	Damaged	11/2/1977	10.00	Black Steel	2	14.6		Not Surveyed			Upper	Not Surveyed	
WTO1	Destroyed	5/1/1979	5.00	PVC	2	30.0		Not Surveyed			Upper	Not Surveyed	

TABLE 2.1
MONITORING WELL STATUS REPORT
HIMCO SITE
ELKHART, INDIANA

<i>Well ID</i>	<i>Status</i>	<i>Installation Date</i>	<i>Screen Length</i> (ft)	<i>Material</i>	<i>Casing Diameter</i> (inches)	<i>Installed Depth</i> (ft bgs)	<i>Reference Elevation</i> (ft AMSL)	<i>Ground Surface</i> (ft AMSL)	<i>Top of Well Screen</i> (ft AMSL)	<i>Bottom of Well Screen</i> (ft AMSL)	<i>Aquifer Designation</i>	<i>Northing</i>	<i>Easting</i>
INTERMEDIATE AQUIFER WELLS (710 - 610 ft AMSL)													
WT101B	Functional	12/14/1990	5.00	Stainless Steel	2	98.0	763.70	761.28	668.28	663.28	Intermediate	2351874.60	235726.81
WT102B	Functional	12/2/1990	5.00	Stainless Steel	2	65.4	768.22	765.87	705.47	700.47	Intermediate	2355133.90	234051.70
WT112B	Functional	8/23/1995	5.00	PVC	2	59.4	765.54	763.55	709.15	704.15	Intermediate	2353912.39	234943.21
WT113B	Functional	8/10/1995	5.00	PVC	2	67.2	771.47	769.52	707.32	702.32	Intermediate	2353861.31	235888.26
WT114B	Functional	8/22/1995	5.00	PVC	2	65.3	768.77	766.95	706.65	701.65	Intermediate	2352092.21	236067.36
WT116B	Functional	8/17/1995	5.00	PVC	2	58.4	763.33	762.04	708.64	703.64	Intermediate	2352190.18	234881.80
WT117B	Functional	8/14/1995	5.00	PVC	2	61.3	766.13	764.20	707.90	702.90	Intermediate	2352463.66	234002.76
WT118B	Functional	8/18/1995	5.00	PVC	2	62.5	765.99	763.56	706.06	701.06	Intermediate	2352178.19	234466.70
WTB3	Functional	10/17/1977	10.00	PVC	5	135.0	762.74	760.62	635.62	625.62	Intermediate	2353858.37	234077.13
WTE1	Functional	10/11/1977	10.00	PVC	5	81.0	765.21	762.54	691.54	681.54	Intermediate	2351825.29	235236.36
WTK1	Damaged	10/13/1977	5.00	PVC	5	62.0			Not Surveyed		Intermediate	Not Surveyed	
LOWER AQUIFER WELLS (610 - 275 ft AMSL)													
WT101C	Functional	12/12/1990	5.00	Stainless Steel	2	165.0	763.57	760.93	600.93	595.93	Lower	2351860.60	235732.84
WT102C	Functional	12/1/1990	5.00	Stainless Steel	2	159.5	768.65	765.94	611.44	606.44	Lower	2355123.61	234053.78
WTB1	Functional	10/6/1977	6.00	PVC	5	473.0	763.06	761.58	294.58	288.58	Lower	2353857.39	234061.79
WTB4	Functional	10/7/1977	5.00	PVC	5	173.0	761.77	760.67	592.67	587.67	Lower	2353855.62	234084.92
WTE3	Functional	10/11/1977	5.00	PVC	5	176.0	764.91	762.27	591.27	586.27	Lower	2351806.96	235231.77
WTJ3	Functional	10/12/1977	5.00	PVC	5	154.0	755.63	753.29	604.29	599.29	Lower	2349818.66	238651.80
WTK3	Damaged	10/13/1977	5.00	PVC	5	185.0			Not Surveyed		Lower	Not Surveyed	

TABLE 2.2

**BASLINE GROUNDWATER AND INTERIM MONITORING PROGRAM WELLS
HIMCO SITE
ELKHART, INDIANA**

WT101A	WT114A
WT101B	WT114B
WT101C	WT115A
WT102A	WT116B*
WT102B	WT117A
WT102C	WT117B
WT103A	WT118B
WT104A	WTB1
WT105A	WTB3
WT106A	WTB4
WT111A	WTE1
WT112A	WTE3
WT112B	WTJ1
WT113A	WTJ3
WT113B	

* Monitoring well not included in 2008 Baseline Groundwater Monitoring Program

TABLE 2.3

**BASELINE GROUNDWATER AND INTERIM MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA**

Volatiles

1,1,1-Trichloroethane	Carbon disulfide
1,1,1,2,2-Tetrachloroethane	Carbon tetrachloride
1,1,2-Trichloroethane	Chlorobenzene
1,1-Dichloroethane	Chlorobromomethane
1,1-Dichloroethene	Chloroethane
1,1-Dichloropropene	Chloroform (Trichloromethane)
1,2,3-Trichlorobenzene	Chloromethane (Methyl Chloride)
1,2,3-Trichloropropane	cis-1,2-Dichloroethene
1,2,4-Trichlorobenzene	cis-1,3-Dichloropropene
1,2,4-Trimethylbenzene	Cymene (p-Isopropyltoluene)
1,2-Dibromo-3-chloropropane (DBCP)	Dibromochloromethane
1,2-Dibromoethane (Ethylene Dibromide)	Dichlorofluoromethane
1,2-Dichlorobenzene	Ethyl Ether
1,2-Dichloroethane	Ethylbenzene
1,2-Dichloroethene (total)	Hexachlorobutadiene
1,2-Dichloropropane	Isopropylbenzene
1,3,5-Trimethylbenzene	m&p-Xylene
1,3-Dichlorobenzene	Methylene chloride
1,3-Dichloropropane	Naphthalene
1,4-Dichlorobenzene	n-Butylbenzene
2,2-Dichloropropane	n-Propylbenzene
2-Butanone (Methyl Ethyl Ketone)	o-Xylene
2-Chloroethyl vinyl ether	Styrene
2-Chlorotoluene	tert-Butylbenzene
2-Hexanone	Tetrachloroethene
2-Phenylbutane (sec-Butylbenzene)	Toluene
4-Chlorotoluene	Total VOCs
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	trans-1,2-Dichloroethene
Acetone	trans-1,3-Dichloropropene
Acrolein	Trichloroethene
Acrylonitrile	Trichlorofluoromethane (CFC-11)
Benzene	Vinyl acetate
Bromobenzene	Vinyl chloride
Bromodichloromethane	Xylene (total)
Bromoform	
Bromomethane (Methyl Bromide)	

TABLE 2.3

**BASELINE GROUNDWATER AND INTERIM MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA**

Semi-Volatiles

1,2,4-Trichlorobenzene	Benzo(a)pyrene
1,2-Dichlorobenzene	Benzo(b)fluoranthene
1,2-Diphenylhydrazine	Benzo(g,h,i)perylene
1,3-Dichlorobenzene	Benzo(k)fluoranthene
1,4-Dichlorobenzene	Benzoic acid
2(3H)-Benzothiazolone	Benzyl Alcohol
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	bis(2-Chloroethoxy)methane
2,4,5-Trichlorophenol	bis(2-Chloroethyl)ether
2,4,6-Trichlorophenol	bis(2-Ethylhexyl)phthalate
2,4-Dichlorophenol	Butyl benzylphthalate
2,4-Dimethylphenol	Carbazole
2,4-Dinitrophenol	Chrysene
2,4-Dinitrotoluene	Dibenz(a,h)anthracene
2,6-Dinitrotoluene	Dibenzofuran
2-Chloronaphthalene	Diethyl phthalate
2-Chlorophenol	Dimethyl phthalate
2-Methylnaphthalene	Di-n-butylphthalate
2-Methylphenol	Di-n-octyl phthalate
2-Nitroaniline	Fluoranthene
2-Nitrophenol	Fluorene
3,3'-Dichlorobenzidine	Hexachlorobenzene
3-Nitroaniline	Hexachlorobutadiene
4,6-Dinitro-2-methylphenol	Hexachlorocyclopentadiene
4-Bromophenyl phenyl ether	Hexachloroethane
4-Chloro-3-methylphenol	Indeno(1,2,3-cd)pyrene
4-Chloroaniline	Isophorone
4-Chlorophenyl phenyl ether	Naphthalene
4-Methylphenol	Nitrobenzene
4-Nitroaniline	N-Nitrosodimethylamine
4-Nitrophenol	N-Nitrosodi-n-propylamine
Acenaphthene	N-Nitrosodiphenylamine
Acenaphthylene	Pentachlorophenol
Aniline	Phenanthrene
Anthracene	Phenol
Benzidine	Pyrene
Benzo(a)anthracene	Total SVOCs

TABLE 2.3

**BASELINE GROUNDWATER AND INTERIM MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA**

Metals

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium Total
Cobalt
Copper
Cyanide (total)
Iron
Lead

Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

PCBs

Aroclor-1016 (PCB-1016)
Aroclor-1221 (PCB-1221)
Aroclor-1232 (PCB-1232)
Aroclor-1242 (PCB-1242)
Aroclor-1248 (PCB-1248)
Aroclor-1254 (PCB-1254)
Aroclor-1260 (PCB-1260)
Total PCBs

Pesticides

4,4'-DDD
4,4'-DDE
4,4'-DDT
Aldrin
alpha-BHC
alpha-Chlordane
beta-BHC
delta-BHC
Dieldrin
Endosulfan I
Endosulfan II

Endosulfan sulfate
Endrin
Endrin aldehyde
Endrin ketone
gamma-BHC (Lindane)
gamma-Chlordane
Heptachlor
Heptachlor epoxide
Methoxychlor
Total Pesticides
Toxaphene

General Chemistry

Bromide
Chloride
Sulfate

TABLE 5.1
TREND TESTS RESULTS SUMMARY
HIMCO SITE
ELKHART, INDIANA

<i>Well</i>	<i>Aquifer</i>	<i>Analyte</i>	<i>Conclusion</i>
WT101B	Intermediate	Sulfate	Decreasing Trend
WT102B	Intermediate	Sulfate	Decreasing Trend
WT102C	Lower	Sulfate	Decreasing Trend
WT117B	Intermediate	Vinyl chloride	Decreasing Trend
WTB1	Lower	Manganese	Increasing Trend
WTB3	Intermediate	Iron	Decreasing Trend
WTE1	Intermediate	Sulfate	Decreasing Trend

TABLE 5.2

**SUMMARY OF DETECTED VOCs - ROUTINE GROUNDWATER MONITORING
HIMCO SITE
ELKHART, INDIANA**

<i>Parameters</i>	<i>Units</i>	<i>Primary MCL</i>	<i>Number of Exceedances</i>	<i>Percent of Exceedances</i>	<i>Number of Samples</i>	<i>Number of Detections</i>	<i>Percent of Detections</i>	<i>Minimum Detection</i>	<i>Maximum Detection</i>
<i>Volatile Organic Compounds</i>									
1,1,1-Trichloroethane	ug/L	200	0	0.0%	177	0	0.0%	N/A	N/A
1,1-Dichloroethane	ug/L	-	-	-	177	50	28.2%	0.23	7.4
1,2,4-Trichlorobenzene	ug/L	70	0	0.0%	177	1	0.6%	0.27	0.27
1,2-Dichloroethane	ug/L	5	0	0.0%	177	1	0.6%	0.25	0.25
1,2-Dichloropropane	ug/L	5	0	0.0%	177	20	11.3%	0.18	0.52
1,4-Dichlorobenzene	ug/L	75	0	0.0%	177	8	4.5%	0.24	3.2
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	-	-	-	177	22	12.4%	0.58	6
Acetone	ug/L	-	-	-	177	13	7.3%	1.1	6.3
Benzene	ug/L	5	7	4.0%	177	31	17.5%	0.26	12
Bromodichloromethane	ug/L	-	-	-	177	2	1.1%	0.22	0.64
Bromoform	ug/L	-	-	-	177	1	0.6%	0.75	0.75
Carbon disulfide	ug/L	-	-	-	177	37	20.9%	0.29	3.6
Chlorobenzene	ug/L	100	0	0.0%	177	6	3.4%	0.2	0.64
Chloroethane	ug/L	-	-	-	177	16	9.0%	0.43	2.9
Chloroform (Trichloromethane)	ug/L	-	-	-	177	10	5.6%	0.18	1.4
Chloromethane (Methyl chloride)	ug/L	-	-	-	177	9	5.1%	0.3	0.55
cis-1,2-Dichloroethene	ug/L	70	0	0.0%	177	39	22.0%	0.21	2.4
Cyclohexane	ug/L	-	-	-	177	9	5.1%	0.12	0.91
Dibromochloromethane	ug/L	-	-	-	177	2	1.1%	0.54	0.87
Dichlorodifluoromethane (CFC-12)	ug/L	-	-	-	177	11	6.2%	0.34	1.6
Isopropyl benzene	ug/L	-	-	-	177	13	7.3%	0.19	0.46
Methylene chloride	ug/L	5	-	-	177	0	0.0%	N/A	N/A
Toluene	ug/L	1000	0	0.0%	177	2	1.1%	0.19	0.52
trans-1,2-Dichloroethene	ug/L	100	0	0.0%	177	1	0.6%	0.19	0.19
Trichloroethene	ug/L	5	0	0.0%	177	3	1.7%	0.37	0.59
Vinyl chloride	ug/L	2	0	0.0%	177	51	28.8%	0.22	1.3

Notes:

J - Estimated.

-- Not applicable.

TABLE 5.3

**SUMMARY OF DETECTED SVOCs - ROUTINE GROUNDWATER MONITORING
HIMCO SITE
ELKHART, INDIANA**

<i>Parameters</i>	<i>Units</i>	<i>Primary MCL</i>	<i>Number of Exceedances</i>	<i>Percent of Exceedances</i>	<i>Number of Samples</i>	<i>Number of Detections</i>	<i>Percent of Detections</i>	<i>Minimum Detection</i>	<i>Maximum Detection</i>
<i>Semivolatile Organic Compounds</i>									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	-	-	-	177	1	0.56%	0.76	0.76
2,6-Dinitrotoluene	ug/L	-	-	-	177	1	0.56%	1.8	1.8
4-Methylphenol	ug/L	-	-	-	177	4	2.26%	0.89	2.1
Acenaphthene	ug/L	-	-	-	177	1	0.56%	0.22	0.22
Acenaphthylene	ug/L	-	-	-	177	1	0.56%	0.22	0.22
Acetophenone	ug/L	-	-	-	177	21	11.86%	0.38	2.7
Anthracene	ug/L	-	-	-	177	1	0.56%	0.23	0.23
Benzo(a)anthracene	ug/L	-	-	-	177	1	0.56%	0.24	0.24
Benzo(b)fluoranthene	ug/L	-	-	-	177	1	0.56%	0.24	0.24
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	2	1.13%	177	32	18.08%	0.84	13
Butyl benzylphthalate (BBP)	ug/L	-	-	-	177	1	0.56%	1.3	1.3
Caprolactam	ug/L	-	-	-	177	3	1.69%	0.92	2.8
Chrysene	ug/L	-	-	-	177	1	0.56%	0.2	0.2
Diethyl phthalate	ug/L	-	-	-	177	6	3.39%	2	6.9
Fluoranthene	ug/L	-	-	-	177	3	1.69%	0.31	0.36
Phenanthrene	ug/L	-	-	-	177	2	1.13%	0.25	0.5
Phenol	ug/L	-	-	-	177	2	1.13%	1.4	1.5
Pyrene	ug/L	-	-	-	177	4	2.26%	0.23	0.25

Notes:

J - Estimated.

-- Not applicable.

TABLE 5.4

**SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS - ROUTINE GROUNDWATER MONITORING
HIMCO SITE
ELKHART, INDIANA**

<i>Parameters</i>	<i>Units</i>	<i>Primary MCL</i>	<i>Number of Exceedances</i>	<i>Secondary MCL</i>	<i>Number of Exceedances</i>	<i>RDA</i>	<i>Number of Exceedances</i>	<i>Number of Samples</i>	<i>Number of Detections</i>	<i>Minimum Detection</i>	<i>Maximum Detection</i>
<i>Metals</i>											
Aluminum	ug/L	-	-	50	53	-	-	177	71	19.1	630000
Antimony	ug/L	6	0	-	-	-	-	177	37	0.13	1.2
Arsenic	ug/L	10	3	-	-	-	-	177	153	0.4	38.6
Barium	ug/L	2000	0	-	-	-	-	177	176	4	1400
Beryllium	ug/L	4	2	-	-	-	-	177	18	0.46	12.9
Calcium	ug/L	-	-	-	-	250000	18	177	177	5900	815000
Chromium	ug/L	100	4	-	-	-	-	177	72	2.2	506
Cobalt	ug/L	-	-	-	-	-	-	177	31	1.7	96.2
Copper	ug/L	1300	0	1000	0	-	-	177	16	7.2	570
Iron	ug/L	-	-	300	153	1000	103	177	163	96.4	177000
Lead	ug/L	15	3	-	-	-	-	177	15	1.9	280
Magnesium	ug/L	-	-	-	-	-	-	177	177	1180	50800
Manganese	ug/L	-	-	50	124	-	-	177	171	0.64	2810
Mercury	ug/L	2	0	-	-	-	-	177	6	0.13	1.4
Nickel	ug/L	-	-	-	-	-	-	177	59	3.2	564
Potassium	ug/L	-	-	-	-	-	-	177	168	550	95900
Selenium	ug/L	50	0	-	-	-	-	177	5	4.4	5.5
Silver	ug/L	-	-	100	0	-	-	177	1	2.4	2.4
Sodium	ug/L	-	-	-	-	150000	7	177	177	1320	271000
Thallium	ug/L	2	2	-	-	-	-	177	31	0.14	2.7
Vanadium	ug/L	-	-	-	-	-	-	177	41	0.65	548
Zinc	ug/L	-	-	5000	0	-	-	177	41	5.5	1370
<i>General Chemistry</i>											
Bromide	mg/L	-	-	-	-	-	-	177	48	0.1	2.8
Chloride	mg/L	-	-	250	6	-	-	177	176	0.6	689
Cyanide (total)	mg/L	0.2	0	-	-	-	-	148	13	0.0052	0.088
Sulfate	mg/L	-	-	250	30	-	-	176	169	0.9	1160

Notes:

J - Estimated.

-- Not applicable.

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT101A	16.3	Aluminum	µg/L	860	22.5 J	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	6.8	8.9	6.7	6.6
		Barium	µg/L	75	73.7 J	72.5 J	65.3 J	63.9 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	308000	257000	226000	304000
		Chromium (Total)	µg/L	1180	2.2 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	37200	37300	29000	35800 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	7840	9360	8840	11700
		Manganese	µg/L	712	2630	2420	2010	2700
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.18 J
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	2580 J	3170 J	3200 J	3280 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	110000	11800	20300	20500	19500
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.10 J	0.50 U	0.50 U	0.20 J
		Chloride	µg/L	258000	8.4	23.5	26.3	21.8
		Cyanide (total)	µg/L	10 U	0.010 U	0.0073 J	0.010 U	0.0067 J
		Sulfate	µg/L	965000	419	375	347	434

TABLE 5.5
BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT102A (Background well)	16	Aluminum	µg/L	860	262	22.1 J	262	554
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	0.15 J	2.0 U
		Arsenic	µg/L	6.9 U	0.71 J	0.78 J	0.55 J	0.79 J
		Barium	µg/L	75	32.6 J	34.0 J	41.0 J	42.3 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.48 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	73200	89500	93600	89000
		Chromium (Total)	µg/L	1180	31.3	7.2 J	128	427
		Cobalt	µg/L	50 U	1.9 J	50.0 U	2.7 J	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	7.5 J
		Iron	µg/L	7720	855	107	1040	2760
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	14000	15900	17000	16800
		Manganese	µg/L	712	195	110	112	641
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	21.9 J	44.3	129	86.6
		Potassium	µg/L	2830	1090 J	943 J	1530 J	1320 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	61200	55300	70400	71400
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	0.69 J	3.3 J
		Zinc	µg/L	34.1 U	20.0 U	7.3 J	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	108	142	168	182
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	29.7	56.3	73	61.5

TABLE 5.5

BACKGROUND VALUE CALCULATIONS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT103A	16	Aluminum	µg/L	860	122	68.3 U	50.0 U	115
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	2.7	1.5	1.6	1.8
		Barium	µg/L	75	42.4 J	49.9 J	49.1 J	48.0 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	114000	114000	105000	129000
		Chromium (Total)	µg/L	1180	2.4 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1120	810	1380	1760
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	16600	15200	17200	22600
		Manganese	µg/L	712	253	280	229	246
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1220 J	1600 J	2050 J	1370 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	11300	13300	13200	15500
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	0.14 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	21.1	26.3	29.4	29.5 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.023 U	0.0057 J
		Sulfate	µg/L	965000	182	172	231	259

TABLE 5.5
BACKGROUND VALUE CALCULATIONS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT104A	16.3	Aluminum	µg/L	860	50.0 U	50.0 U / 50.0 U	58.6	23.6 J
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Barium	µg/L	75	5.7 J	4.6 J / 5.1 J	5.0 J	200 U
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U / 1.0 U	0.55 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	22400	23700 / 24400	18800	21200
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U / 25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	100 U	100 U / 100 U	329	100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	6130	5380 / 5540	4910 J	4960 J
		Manganese	µg/L	712	15.0 U	15.0 U / 15.0 U	3.1 J	15.0 U
		Mercury	µg/L	0.2 U	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U / 40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	5000 U	5000 U / 5000 U	5000 U	550 J
		Selenium	µg/L	6.0 UJ	5.5	5.0 U / 5.0 U	4.9 J	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	3580 J	3330 J / 3550 J	3150 J	2330 J
		Thallium	µg/L	12.35	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	0.66 J / 0.68 J	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U / 5.5 J	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U / 0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	3.4	1.0 / 1.0	0.70 J	0.80 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U / 0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	25.2	7.2 / 7.1	14.8	13.9

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT105A	16	Aluminum	µg/L	860	25.4 J	65.0 U	73.6	136
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	0.52 J	1.0 U	1.0 U	0.47 J
		Barium	µg/L	75	32.3 J	23.1 J	21.3 J	16.6 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.75 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	39300	48100	48500	59600
		Chromium (Total)	µg/L	1180	2.8 J	11.1	9.7 J	48.3
		Cobalt	µg/L	50 U	50.0 U	2.5 J	50.0 U	2.8 J
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	303	448	332	817
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	9480	11000	11300	13300
		Manganese	µg/L	712	116	131	65.4	65.8
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	14.1 J	15.3 J	19.4 J	21.1 J
		Potassium	µg/L	2830	1070 J	1260 J	1220 J	1320 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	7640	6700	6170	7080
		Thallium	µg/L	12.35	1.0 U	0.14 J	0.22 J	0.23 J
		Vanadium	µg/L	50 U	50.0 U	0.79 J	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	5.9 J	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 UJ	0.50 U
		Chloride	µg/L	258000	2.8	2.7	3.4	2.8
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	19.4	15.6	13.7 J	14.9

TABLE 5.5

BACKGROUND VALUE CALCULATIONS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT106A	16.3	Aluminum	µg/L	860	349	50.0 U	19.1 J	942
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	0.21 J
		Arsenic	µg/L	6.9 U	9	2.1	2.7	38.6
		Barium	µg/L	75	43.2 J	38.9 J	42.2 J	79.3 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	108000	105000	113000	124000
		Chromium (Total)	µg/L	1180	18.7	10.0 U	10.0 U	100
		Cobalt	µg/L	50 U	2.5 J	50.0 U	50.0 U	4.2 J
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	6310	1410	1760	24500
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	12700	13800	13500	14600
		Manganese	µg/L	712	804	488	481	1230
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	3.4 J	40.0 U	40.0 U	9.3 J
		Potassium	µg/L	2830	1650 J	1480 J	1650 J	1760 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	21200	16200	16200	17400
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	0.18 J
		Vanadium	µg/L	50 U	1.9 J	50.0 U	50.0 U	5.3 J
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	34.4	27.9	34.2	43.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	78.5	90.2	109	129

TABLE 5.5

**BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT111A	20	Aluminum	µg/L	860	1560	384	234	217
		Antimony	µg/L	42.2 UJ	0.18 J	0.22 J	0.20 J	0.18 J
		Arsenic	µg/L	6.9 U	1.9	5.4	5.4	4.6
		Barium	µg/L	75	44.0 J	84.1 J	126 J	86.7 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.51 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	66300	178000	222000	218000
		Chromium (Total)	µg/L	1180	10.0 U	3.3 J	3.1 J	10.0 U
		Cobalt	µg/L	50 U	50.0 U	1.8 J	1.7 J	2.2 J
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1020	3000	3020	3110 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	4930 J	12300	14900	15000
		Manganese	µg/L	712	203	480	581	556
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1860 J	2500 J	4100 J	3670 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	14600	25100	28300	25800 J
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	2.6 J	3.6 J	3.3 J	50.0 U
		Zinc	µg/L	34.1 U	7.0 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.30 J	0.40 J	0.5
		Chloride	µg/L	258000	10.2	14.1	18.9	24.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	102	257	346	368

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT112A	15.4	Aluminum	µg/L	860	85.1	666	50.0 U	50.0 U / 50.0 U
		Antimony	µg/L	42.2 UJ	2.0 U	0.13 J	2.0 U	2.0 U / 2.0 U
		Arsenic	µg/L	6.9 U	1	5.2	0.66 J	0.77 J / 0.74 J
		Barium	µg/L	75	30.1 J	61.6 J	31.7 J	31.8 J / 32.4 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.54 J	1.0 U / 1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Calcium	µg/L	275000	233000	297000	213000	311000 / 314000
		Chromium (Total)	µg/L	1180	10.0 U	9.3 J	10.0 U	10.0 U / 10.0 U
		Cobalt	µg/L	50 U	50.0 U	2.2 J	50.0 U	50.0 U / 50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U / 25.0 U
		Iron	µg/L	7720	343	3320	96.4 J	100 U / 100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U
		Magnesium	µg/L	26700	17800	16400	13200	17100 / 16900
		Manganese	µg/L	712	54.5	170	10.7 J	3.3 J / 4.1 J
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U / 0.20 U
		Nickel	µg/L	146	40.0 U	6.8 J	40.0 U	40.0 U / 40.0 U
		Potassium	µg/L	2830	2590 J	2770 J	2760 J	2680 J / 2800 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U / 5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Sodium	µg/L	106000	20400	15200	22100	11300 / 10900
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Vanadium	µg/L	50 U	50.0 U	2.1 J	50.0 U	50.0 U / 50.0 U
		Zinc	µg/L	34.1 U	20.0 U	6.8 J	20.0 U	20.0 U / 20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	2.5 U / 2.5 U
		Chloride	µg/L	258000	41.8	33.2	38.9	31.5 / 30.9
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U / 0.010 U
		Sulfate	µg/L	965000	520	606	445	758 / 762

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT113A	21.7	Aluminum	µg/L	860	50.0 U	32.3 J	34.1 J	50.0 U
		Antimony	µg/L	42.2 UJ	0.19 J	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	0.82 J	1	0.61 J	0.62 J
		Barium	µg/L	75	15.6 J	14.8 J	14.4 J	16.4 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.53 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	56500	53700	54700	59800
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U	10.0 U	3.9 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	100 U	100 U	100 U	100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	13700	12900	13200	14600
		Manganese	µg/L	712	15.0 U	9.2 J	3.4 J	2.9 J
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1370 J	1080 J	1290 J	1300 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	24700	18300	16800	21700
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	40.1	32.3	36.7	45.8
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	18.6	17.2	17.3	16.1

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT114A	22	Aluminum	µg/L	860	50.0 U	50.0 U	50.0 U	25.2 J
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	1.8	2.2	3	2.8
		Barium	µg/L	75	82.2 J	118 J	99.0 J	83.8 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	109000	137000	104000	101000
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U	10.0 U	5.3 J
		Cobalt	µg/L	50 U	1.9 J	2.0 J	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1160	1810	2500	2120
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	20000	25200	18000	18100
		Manganese	µg/L	712	435	774	375	454
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	4.3 J	3.4 J	5.4 J
		Potassium	µg/L	2830	2030 J	2010 J	1780 J	2060 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	210000	271000	244000	231000
		Thallium	µg/L	12.35	1.0 U	1.0 U	0.26 J	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.20 J	0.50 U	2.5 U
		Chloride	µg/L	258000	472	689	423	398
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	39.7	34	409	57

TABLE 5.5

BACKGROUND VALUE CALCULATIONS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT115A	17.4	Aluminum	µg/L	860	21000 / 19300	17600	3880 / 4060	10500
		Antimony	µg/L	42.2 UJ	0.74 J / 0.70 J	2.0 U	0.40 J / 0.42 J	0.22 J
		Arsenic	µg/L	6.9 U	2.7 / 2.5	2.6	1.6 / 1.6	1.9
		Barium	µg/L	75	77.8 J / 75.9 J	166 J	115 J / 113 J	126 J
		Beryllium	µg/L	3.1 BJ	1.0 U / 1.0 U	0.63 J	1.0 U / 1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U / 1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Calcium	µg/L	275000	28400 / 28100	253000	355000 / 347000	271000
		Chromium (Total)	µg/L	1180	22.5 / 18.6	17.6	6.0 J / 6.0 J	10.5
		Cobalt	µg/L	50 U	4.3 J / 3.0 J	4.0 J	2.5 J / 2.0 J	2.8 J
		Copper	µg/L	50.6	23.9 J / 16.4 J	13.8 J	25.0 U / 25.0 U	9.0 J
		Iron	µg/L	7720	6830 / 6350	8040	2910 / 4230	5720 J
		Lead	µg/L	3.0 U	9.6 / 9.9	5.5	3.0 U / 3.0 U	4
		Magnesium	µg/L	26700	3450 J / 3330 J	8730	16000 / 15700	9450
		Manganese	µg/L	712	59.7 / 56.0	316	143 / 146	139
		Mercury	µg/L	0.2 U	0.20 U / 0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U
		Nickel	µg/L	146	23.8 J / 19.6 J	17.5 J	6.2 J / 5.0 J	11.6 J
		Potassium	µg/L	2830	1950 J / 1880 J	4000 J	5210 / 5100	4620 J
		Selenium	µg/L	6.0 UJ	5.0 U / 5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U / 10.0 U	10.0 U	10.0 U / 10.0 U	10.0 U
		Sodium	µg/L	106000	4650 J / 4000 J	16900	22500 / 22200	18600
		Thallium	µg/L	12.35	1.0 U / 1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Vanadium	µg/L	50 U	30.4 J / 27.7 J	26.3 J	10.0 J / 10.2 J	17.2 J
		Zinc	µg/L	34.1 U	59.6 U / 57.2 U	43.2	23.0 U / 20.0 U	39.9
		Bromide	µg/L	500 U	0.50 U / 0.50 U	0.30 J	0.40 J / 0.40 J	0.40 J
		Chloride	µg/L	258000	1.6 / 1.6	10.1	13.1	15.7
		Cyanide (total)	µg/L	10 U	0.010 U / 0.010 U	0.010 U	0.0052 J / 0.010 U	0.010 U
		Sulfate	µg/L	965000	10.9 / 11.1	238	314	232

TABLE 5.5

**BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT116A		Aluminum	µg/L	860	NS	50.0 U	50.0 U	33.5 J
		Antimony	µg/L	42.2 UJ	NS	2.0 U	1.2 J	0.74 J
		Arsenic	µg/L	6.9 U	NS	5.2	2	7.8
		Barium	µg/L	75	NS	93.1 J	58.9 J	94.9 J
		Beryllium	µg/L	3.1 BJ	NS	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	NS	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	NS	815000	669000	685000
		Chromium Total	µg/L	1180	NS	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50.0 U	NS	1.8 J	3.3 J	1.7 J
		Copper	µg/L	50.6	NS	38.4	24.4 J	53.5
		Iron	µg/L	7720	NS	3870	361	28700
		Lead	µg/L	3.0 U	NS	2.8 J	3.0 U	5.9
		Magnesium	µg/L	26700	NS	43200	41000	39200
		Manganese	µg/L	712	NS	648	576	646
		Mercury	µg/L	0.2 U	NS	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	NS	3.3 J	13.1 J	5.5 J
		Potassium	µg/L	2830	NS	23600	18200	15100
		Selenium	µg/L	6.0 UJ	NS	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	NS	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	NS	164000	148000	125000
		Thallium	µg/L	12.35	NS	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	NS	50.0 U	50.0 U	2.5 J
		Zinc	µg/L	34.1 U	NS	78.5	395	51.7 J
		Bromide	µg/L	500 U	NS	2.8	2.3	1.7
		Chloride	µg/L	258000	NS	14.8	18.1	14.7 J
		Cyanide (total)	µg/L	10.0 U	NS	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	NS	1160	1160	992

TABLE 5.5

BACKGROUND VALUE CALCULATIONS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT117A	15.5	Aluminum	µg/L	860	1700	3540	931 / 1000	2170
		Antimony	µg/L	42.2 UJ	2.0 U	0.16 J	0.34 J / 0.35 J	0.19 J
		Arsenic	µg/L	6.9 U	1.0 U	1.0 U	0.40 J / 1.0 U	1.0 U
		Barium	µg/L	75	9.6 J	20.7 J	33.1 J / 31.6 J	26.7 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.48 J / 0.49 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Calcium	µg/L	275000	5900	12200	58700 / 55700	28900
		Chromium (Total)	µg/L	1180	10.0 U	4.0 J	6.9 J / 5.4 J	5.1 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U / 50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U / 25.0 U	25.0 U
		Iron	µg/L	7720	867	1360	474 / 471	923
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U
		Magnesium	µg/L	26700	1180 J	2860 J	7550 / 7270	4080 J
		Manganese	µg/L	712	13.3 J	18.4	184 / 170	39.6
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U / 4.8 J	4.8 J
		Potassium	µg/L	2830	5000 U	5000 U	1880 J / 1780 J	971 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U / 10.0 U	10.0 U
		Sodium	µg/L	106000	1320 J	1760 J	7210 / 6630	3480 J
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U / 1.0 U	0.39 J
		Vanadium	µg/L	50 U	2.4 J	5.2 J	2.1 J / 2.3 J	3.7 J
		Zinc	µg/L	34.1 U	7.7 J	20.0 U	7.7 J / 7.8 J	22.2 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U / 0.50 U	0.50 U
		Chloride	µg/L	258000	0.60 J	1	2.4 / 2.4	1.2
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U / 0.010 U	0.010 U
		Sulfate	µg/L	965000	6.4	9.2	26.5 / 26.7	19.6

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

⁽¹⁾ Background Values are UTIs on the 95th percentile of the background, with 95 percent confidence.

UTIs are calculated using a method appropriate for the observed data distribution.

Values highlighted in bold and boxed exceed the background value.

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT101B	98	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	0.14 J	0.37 J	2.0 U	0.31 J
		Arsenic	µg/L	7.94	0.72 J	1.4	0.64 J	0.68 J
		Barium	µg/L	133	67.5 J	50.6 J	59.3 J	61.8 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	116000	72600	110000	103000
		Chromium (Total)	µg/L	89.1	5.2 J	7.9 J	2.3 J	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	518	477	457	574 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	42100	44300	38400	39500
		Manganese	µg/L	173	55.1	33.4	40.6	35
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	5.3 J	40.0 U	40.0 U
		Potassium	µg/L	7790	19300	47900	10100	16300
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	28700	41100	21800	23800
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	5.8 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.20 J	0.50 U	0.10 J
		Chloride	µg/L	55000	29.8	27.1	29.8	30.4
		Cyanide (total)	µg/L	10 U	0.010 U	0.016	0.039	0.051
		Sulfate	µg/L	430000	109	96.5 J	77.6	63.7

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT102B (Background well)	65.4	Aluminum	µg/L	161	50.0 U / 50.0 U	50.0 U	23.2 J	50.0 U
		Antimony	µg/L	37 U	0.26 J / 2.0 U	0.44 J	2.0 U	0.17 J
		Arsenic	µg/L	7.94	3.9 / 3.9	2.4	3	2.8
		Barium	µg/L	133	101 J / 97.7 J	107 J	101 J	124 J
		Beryllium	µg/L	2.7 U	1.0 U / 1.0 U	1.0 U	0.47 J	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U / 1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	57300 / 53100	45900	57000	62800
		Chromium (Total)	µg/L	89.1	10.0 U / 2.5 J	20.2	6.9 J	8.4 J
		Cobalt	µg/L	50 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U / 25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	564 / 541	857	676	677
		Lead	µg/L	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21400 / 21000	22600	21400	23600
		Manganese	µg/L	173	57.5 / 52.0	37.7	51.9	50.4
		Mercury	µg/L	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U / 40.0 U	7.5 J	3.2 J	3.5 J
		Potassium	µg/L	7790	3610 J / 4780 J	6240 J	2920 J	2750 J
		Selenium	µg/L	5.0 U	5.0 U / 4.4 J	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U / 10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	25000 / 26100	30000	24100	25600
		Thallium	µg/L	9.85	1.0 U / 1.0 U	0.21 J	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U / 20.0 U	7.9 J	5.5 J	20.0 U
		Bromide	µg/L	500 U	0.50 U / 0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	46.7 / 1.0 U	49.2	46.7	48.3
		Cyanide (total)	µg/L	10 U	0.010 U / 0.010 U	0.0070 J	0.010 U	0.010 U
		Sulfate	µg/L	430000	44.9 / 1.0 U	45.6	40.8	35.3

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT112B	59.4	Aluminum	µg/L	161	50.0 U	184	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	3.7	3.8	3.2	3.1
		Barium	µg/L	133	132 J	145 J	136 J	148 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	0.63 J	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	87400	90900	87700	91300
		Chromium (Total)	µg/L	89.1	10.0 U	2.6 J	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1440	1920	1520	1500
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	25300	26300	25600	26900
		Manganese	µg/L	173	112	123	111	113
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	3.5 J	40.0 U	40.0 U
		Potassium	µg/L	7790	1890 J	1740 J	1940 J	2020 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	4.5 J	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21500	24800	24700	24600
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	10.5 J	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	51.5	49.3	47.2	51.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	116	102	136	164

TABLE 5.6

BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT113B	67.2	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.5	2.7	2.4	2.3
		Barium	µg/L	133	69.0 J	73.9 J	70.7 J	70.4 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	72500	76400	74400	73900
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	15.7
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1220	1260	1240	1290
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	19000	20300	20000	20200
		Manganese	µg/L	173	68.6	68.7	68.8	70.2
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	8.6 J
		Potassium	µg/L	7790	2010 J	1730 J	1930 J	2070 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21500	23000	20200	19600
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.16 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	37.1	34.5	29.7	35
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	37.2	37.9	32.7	38.1

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT114B	65.3	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	8.3	8.2	7.4	7.6
		Barium	µg/L	133	44.4 J	43.8 J	45.0 J	53.2 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	83000	82500	85400	80500
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	2180	2320	2290	2310
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	18100	18200	18700	17900
		Manganese	µg/L	173	37.9 J	40.6	39.1	38.4
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	1120 J	979 J	1070 J	1340 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	25200	19700	20700	39900
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.34 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	49.9	42.8	53.8 J	71.6
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	100	99.1	95.5	97.2

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT116B	58.4	Aluminum	µg/L	161	50.0 U	55.9 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	1.6	0.42 J	1.0 U	1.0 U
		Barium	µg/L	133	135 J	140 J	155 J	167 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	149000	136000	149000	150000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	3840	3520	3810	3890
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	18900	16000	16500	14600
		Manganese	µg/L	173	143	132	141	132
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	4760 J	5390 J	5720	6480
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	24500	19800	21200	23800
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.33 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.50 U	0.30 J	0.30 J
		Chloride	µg/L	55000	34.4	35.2	33.9	35.4 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.0095 J
		Sulfate	µg/L	430000	178	184	191	185

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT117B	61.3	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.4	2.5	1.5	1.5
		Barium	µg/L	133	52.9 J	34.3 J	35.5 J	30.6 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	213000	132000	135000	121000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	6200	4100	3710	3160
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21600	16000	15900	17800
		Manganese	µg/L	173	169	130	118	93.1
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.13 J
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	2280 J	1790 J	1920 J	1450 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	31700	21900	20000	20600
		Thallium	µg/L	9.85	0.30 J	1.0 U	1.0 U	0.21 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.40 J	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	27.8	39.1	36.2	40.5
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	235	194	169	177

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT118B	62.5	Aluminum	µg/L	161	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.4	3.6 / 3.5	2.3	2.6
		Barium	µg/L	133	58.3 J	57.8 J / 56.7 J	47.4 J	60.7 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	154000	155000 / 153000	130000	163000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U / 25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	4700	5190 / 5160	4120	5510 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	16600	17000 / 16900	13900	18300
		Manganese	µg/L	173	129	133 / 131	111	135
		Mercury	µg/L	0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U / 40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	3800 J	3620 J / 3560 J	3310 J	3920 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21400	21500 / 21300	18500	21900
		Thallium	µg/L	9.85	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U / 20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U / 0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	33.5	36	32.5	33.3
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U / 0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	181	182	176	193

TABLE 5.6

**BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTB3	135	Aluminum	µg/L	161	50.0 U	55.7 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	4.9	5.5	5.1	3.9
		Barium	µg/L	133	64.0 J	71.0 J	73.5 J	63.3 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	72000	77900	84200	74100
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	2.9 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1230	850	473	405
		Lead	µg/L	3.0 U	2.0 J	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21900	19800	21700	21700
		Manganese	µg/L	173	158	264	281	193
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	1160 J	1130 J	1150 J	1070 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	16100	14900	15400	15500
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	1.0 U	0.20 J
		Chloride	µg/L	55000	53.5	54.7	47.9	57.4 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.02
		Sulfate	µg/L	430000	72.4	68.6	62.5	68.4

TABLE 5.6

BACKGROUND VALUES CALCULATIONS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTE1	81	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U / 2.0 U
		Arsenic	µg/L	7.94	1.3	2.7	1.6	1.7 / 1.5
		Barium	µg/L	133	41.8 J	45.3 J	36.4 J	42.0 J / 40.6 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Calcium	µg/L	86000	102000	105000	87200	96300 / 94000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U / 25.0 U
		Iron	µg/L	1870	569	6090	603	176 J / 188 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U
		Magnesium	µg/L	25300	16400	16300	14400	16100 / 15700
		Manganese	µg/L	173	56.5	232	121	168 / 163
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U / 0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U / 40.0 U
		Potassium	µg/L	7790	3350 J	3170 J	2530 J	2930 J / 2900 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U / 5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Sodium	µg/L	31100	18100	16400	16200	17000 / 16400
		Thallium	µg/L	9.85	0.16 J	1.0 U	0.56 J	1.0 U / 1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U / 20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.30 J	0.50 U / 0.50 U
		Chloride	µg/L	55000	34.3	31.4	34.4	35.3 / 35.3
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U / 0.010 U
		Sulfate	µg/L	430000	134	130	103	88.1 / 87.9

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination

J - Analyte was estimated.

⁽¹⁾ Background Values are UTLs on the 95th percentile of the background, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

Values highlighted in bold and boxed exceed the background value.

TABLE 5.7

BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WT101C	165	Aluminum	µg/L	3420	2850	218	78.3	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	8.1	8.2	7.9	8.1
		Barium	µg/L	346	231	93.2 J	82.5 J	77.4 J	78.1 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	49500	49600	43800	47300
		Chromium (Total)	µg/L	33.6	183	4.6 J	2.3 J	10.0 U	2.3 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	1190	1080	896	926 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20100	20300	17800	19200
		Manganese	µg/L	570	468	17.1	15.5	10.8 J	9.5 J
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	3.6 J	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	2800 J	3730 J	4180 J	2720 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	21800	21100	20000	19500
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	8.1 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.20 J	0.20 J	0.20 J	0.20 J
		Chloride	µg/L	71800	182000	2.6	2.5	4.1	7.8
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	0.90 J	1.1	1.0 U	1.4

TABLE 5.7

**BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower- Aquifer ¹	Combined- Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WT102C (Background well)	159.5	Aluminum	µg/L	3420	2850	185	489	2010	790
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	0.18 J	0.48 J	0.48 J
		Arsenic	µg/L	5.17	7.61	2.3	2.1	3.1	3.4
		Barium	µg/L	346	231	166 J	177 J	203	224
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	0.57 J	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	65700	59500	97400	74600
		Chromium (Total)	µg/L	33.6	183	10.0 U	8.0 J	8.3 J	5.1 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	418	1130	3330	1620
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	1.9 J	3.0 U
		Magnesium	µg/L	60100	37700	27500	28900	45800	31800
		Manganese	µg/L	570	468	168	164	379	331
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	40.0 U	5.7 J	6.4 J	4.3 J
		Potassium	µg/L	3260	5510	1120 J	1700 J	2230 J	1420 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	8640	35400	23500	11000
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	1.4 J	4.5 J	1.6 J
		Zinc	µg/L	40.1	34.1 U	20.0 U	9.7 J	20.9	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.50 U	0.50 U	0.30 J
		Chloride	µg/L	71800	182000	61.5	56.3	53.6	58.2
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	38.3	32.9	22.8	31.2

TABLE 5.7

BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTB1	473	Aluminum	µg/L	3420	2850	50.0 U	51.5 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	0.73 J	1.0 U	1.0 U	1.0 U
		Barium	µg/L	346	231	154 J	148 J	161 J	154 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	49000	49300	53800	50300
		Chromium (Total)	µg/L	33.6	183	10.0 U	10.0 U	13.1	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	691	543	682	590
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20000	20100	22100	21100
		Manganese	µg/L	570	468	39.1	39.3	46.5	39.8
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	13.1 J	12.4 J	26.2 J	11.9 J
		Potassium	µg/L	3260	5510	2110 J	1970 J	2130 J	2100 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	56800	56700	61600	59500
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	43.6 U	37.6 U	40.6 U	37
		Bromide	µg/L	500 U	500 U	0.20 J	0.20 J	0.5	0.20 J
		Chloride	µg/L	71800	182000	67.2	67.7	66.4	68.3 J
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 5.7

BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTB4	173	Aluminum	µg/L	3420	2850	50.0 U	56.5 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	1.4	0.92 J	0.73 J	1.0 U
		Barium	µg/L	346	231	41.5 J	39.6 J	39.2 J	38.5 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	64200	63700	64600	57300
		Chromium (Total)	µg/L	33.6	183	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	414	367	444	110
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20900	20600	21000	19600
		Manganese	µg/L	570	468	198	195	202	171
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	727 J	5000 U	5000 U	787 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	3770 J	4020 J	3700 J	4540 J
		Thallium	µg/L	1.0 U	12.35	0.20 J	1.0 U	0.22 J	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	71800	182000	39.1	38.7	37.8	31.4 J
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	30.7	26.4	31.8	1.5

TABLE 5.7

BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTE3	176	Aluminum	µg/L	3420	2850	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	6	4.6	3.6	3.1
		Barium	µg/L	346	231	57.8 J	58.1 J	48.9 J	51.5 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	128000	101000	117000	114000
		Chromium (Total)	µg/L	33.6	183	5.5 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	1.7 J	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	2390	172	2770	648 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	41700	34900	35600	35600
		Manganese	µg/L	570	468	39.4	32.9	35.8	33.6
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	4.7 J	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	3450 J	2790 J	3040 J	3150 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	4.8 J	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	2.4 J	10.0 U
		Sodium	µg/L	70800	87700	22100	17800	18800	18700
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	0.16 J	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.10 J	0.50 U	0.50 U
		Chloride	µg/L	71800	182000	25.9	17.2	25.5	24.5
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.088	0.010 U	0.013
		Sulfate	µg/L	68700	430000	186	55.5	160	124

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

⁽¹⁾ Background Values are UTLs on the 95th percentile of the background, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

Values highlighted in bold and boxed exceed the lower-aquifer or combined-aquifer background value.

Values highlighted in bold and double-boxed exceed both the lower-aquifer and combined-aquifer background values.

TABLE 5.8

SUMMARY OF DETECTED METALS - WT115A NOVEMBER 6, 2008 GROUNDWATER SAMPLE
HIMCO SITE
ELKHART, INDIANA

<i>Sample Location:</i>				WT115A	WT115A
<i>Sample ID:</i>				GW-WT115A-110608-23	GW-WT115D-110608-24
<i>Sample Date:</i>				11/6/2008	11/6/2008
	EPA		# of a criteria		Duplicate
<i>Parameter</i>	<i>Primary MCL</i>	<i>Units</i>	<i>Exceedances</i>		
	<i>a</i>				
<i>Metals</i>					
Aluminum	-	ug/L	--	541000 ^o	630000 ^o
Antimony	6	ug/L	0	0.66 J	0.82 J
Arsenic	10	ug/L	4	27.3 ^a	30.8 ^a
Barium	2000	ug/L	0	1220	1400
Beryllium	4	ug/L	2	11.1 ^a	12.9 ^a
Calcium	-	ug/L	--	353000 ^c	339000 ^c
Chromium Total	100	ug/L	2	434 ^a	506 ^a
Cobalt	-	ug/L	--	83.6	96.2
Copper	1300	ug/L	0	493	570
Iron	-	ug/L	--	152000 ^{bc}	177000 ^{bc}
Lead	15	ug/L	3	231 ^a	280 ^a
Magnesium	-	ug/L	--	45100	50800
Manganese	-	ug/L	--	689 ^o	779 ^o
Mercury	2	ug/L	0	1.3	1.4
Nickel	-	ug/L	--	481	564
Potassium	-	ug/L	--	30300	34400
Sodium	-	ug/L	--	20100	18600
Thallium	2	ug/L	2	2.6 ^a	2.7 ^a
Vanadium	-	ug/L	--	470	548
Zinc	-	ug/L	--	1130	1370
<i>General Chemistry</i>					
Bromide	-	mg/L	--	0.40 J	0.40 J
Chloride	-	mg/L	--	16.8	17.5
Cyanide (total)	0.2	mg/L	0	-	-
Sulfate	-	mg/L	--	257 ^o	270 ^o

Notes:

J - Estimated.

UJ - Estimated reporting limit.

-- Not applicable.

APPENDIX A

e:DAT (ELECTRONIC DATA ACCESS TOOL)

SDMS US EPA Region V

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APPENDIX B

TABLE OF ANALYTICAL RESULTS

SDMS US EPA Region V

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APPENDIX C

LABORATORY REPORTS AND DATA VALIDATION MEMORANDA



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& ASSOCIATES**

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MEMORANDUM

TO: Denise Quigley

FROM: Steve Day/br/10 *SD*

C.C.: Alan Deal

RE: Data Quality Assessment and Validation
April/May 2009 Groundwater Monitoring Event
Himco Site
Elkhart, Indiana

REF. NO.: 039611

DATE: June 4, 2010

The following summarizes the data quality assessment and validation conducted for the samples collected during the groundwater monitoring event conducted in April and May 2009 at the Himco Site in Elkhart, Indiana. The samples identified in Table 1 were analyzed for U.S. EPA's Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), U.S. EPA's Target Analyte List (TAL) metals, total cyanide, and anions (bromide, chloride, and sulfate) by TestAmerica Laboratories, Inc. of North Canton, Ohio. The methods of analysis are presented in Table 2. The data quality evaluation criteria were established by the site-specific quality assurance project plan (QAPP).¹

Sample Receipt and Holding Time Period Compliance

All samples were received by the laboratory intact, properly preserved, with appropriate chain-of-custody documentation, and within the proper temperature range. All samples were prepared and analyzed within the holding time periods specified in the QAPP.

Method Blank Sample Data

Method blank sample data were evaluated to verify that analytes detected in the investigative samples were not attributable to laboratory conditions or procedures. Manganese, potassium, thallium, zinc, and bis(2-ethylhexyl)phthalate were detected at estimated concentrations (i.e., less than their respective reporting limits) in method blank samples associated with certain investigative samples. Investigative sample results that were qualified as non-detected for method blank contamination are presented in Table 3. The remaining method blank samples did not contain target analytes or the concentrations of target analytes in the investigative samples were greater than five times (ten times for common laboratory contaminants) their concentrations in the associated method blank samples. Qualification of the investigative sample data is not required in this instance.

¹ Application of data quality evaluation criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540-R-04-004, October 2004.

Continuing Calibration Verification Data

The laboratory noted in its case narrative that the percent recovery of a continuing calibration verification (CCV) standard associated with the potassium analysis of several investigative samples exceeded the upper percent recovery control limit. The investigative sample data qualified for CCV acceptance criteria violation are summarized in Table 4.

Surrogate Compounds Data

Method performance on individual samples analyzed for VOCs and SVOCs was evaluated by the percent recovery data of surrogate compounds added to each sample prior to analysis. The VOC and SVOC surrogate compounds percent recovery acceptance criteria were achieved for all samples.

Laboratory Control Sample Analyses

Analytical accuracy was evaluated by percent recovery data from laboratory control sample (LCS) analyses. Duplicate laboratory control sample (LCS/LCSD) percent recovery and relative percent difference (RPD) data were evaluated to assess the accuracy and precision of laboratory sample batches without project-specific matrix spike/matrix spike duplicate (MS/MSD) samples. The LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix for anions analyses were evaluated by the percent recovery and RPD data from matrix spike/matrix duplicate sample analyses. All matrix spike percent recovery and matrix duplicate RPD data were acceptable or unacceptable percent recovery and/or RPD data were not associated with the investigative samples.

Matrix Spike/Matrix Spike Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix were evaluated by the percent recovery and RPD data from MS/MSD sample analyses. The MS/MSD percent recovery and RPD data were acceptable or unacceptable MS/MSD data were from the analysis of MS/MSD samples that were not associated with the investigative samples.

Sample Quantitation

VOC and SVOC results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "J" qualifier. Metals, total cyanide, and anions results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "B" qualifier. Results flagged as such are estimated concentrations, and the data validation "J" qualifier was applied to these results during the data validation process.

Field Quality Control Sample Analyses

The field quality control samples collected during the sampling event consisted of field equipment rinsate blank, trip blank, and field duplicate samples.

The effectiveness of the field decontamination procedure was evaluated by the data from the analysis of field equipment rinsate blank samples. Field equipment rinsate blank sample GW-WT104A-043009-E contained bis(2-ethylhexyl)phthalate at an estimated concentration of 1.7 µg/L. Associated investigative sample GW-WT104A-043009 contained bis(2-ethylhexyl)phthalate at a similar estimated concentration, and the reported result was qualified as non-detected (U) at the reporting limit (2.0 µg/L). Additional analytes detected in the field equipment rinsate blank samples did not result in qualification of the investigative sample data.

Field duplicate samples were collected to assess the overall precision of the sampling and analysis event. The QAPP requires evaluation of duplicate sample data when the concentrations of analytes detected in both the investigative and field duplicate samples are greater than five times their respective reporting limits. The RPDs calculated from these data are required to be within 50%. Table 5 summarizes the results of, and RPDs calculated for, the investigative and field duplicate samples that met the QAPP-specified evaluation criteria. As shown in Table 5, all RPD data were acceptable, indicating overall precision for the sampling and analysis event also was acceptable.

Sample cross-contamination by VOCs during sample transportation and storage was evaluated by the data from trip blank samples that were submitted to the laboratory for analysis with the investigative groundwater samples. Acetone was detected at estimated concentrations in all trip blank samples, but only one investigative sample, sample GW-WTB3-050609, contained acetone. The estimated acetone concentrations reported for sample GW-WTB3-050609 and its associated trip blank sample were 1.4 µg/L and 1.6 µg/L, respectively. Therefore, the acetone result reported for sample GW-WTB3-050609 was qualified as non-detected (U) at the reporting limit (10 µg/L).

Completeness

Completeness, as determined by the total number of usable results versus the total number of results, was required to be 90% or greater. All data were usable, and the completeness goal was attained.

Overall Assessment

The sample data are suitable for their intended use with the qualifications noted herein.

TABLE 1

**SAMPLE IDENTIFICATION NUMBERS
APRIL/MAY 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

GW-WT102A-042909	GW-WT101C-050509
GW-WT102B-042909	GW-WT111A-050509
GW-WT102B-042909-D	GW-WT117A-050409
GW-WT102C-042909	GW-WT117B-050409
GW-WT104A-043009	GW-WT118B-050509
GW-WT105A-043009	GW-WTJ1-050509
GW-WT106A-043009	GW-WTJ3-050509
GW-WT112A-042909	TRIP BLANK-050409-3
GW-WT112B-042909	W-WT101A-050509-E
GW-WT113A-042909	GW-WT103A-050609
GW-WT113B-042909	GW-WT115A-050609
GW-WT114A-043009	GW-WT115A-050609-D
TRIP BLANK-042909-1	GW-WT116B-050609
W-WT104A-043009-E	GW-WTB1-050609
GW-WT114B-050109	GW-WTB3-050609
GW-WTJ2-050109	GW-WTB4-050609
TRIP BLANK-050109-2	GW-WTE1-050609
GW-WT101A-050509	GW-WTE3-050609
GW-WT101B-050509	TRIP BLANK-050609-4

TABLE 2

SUMMARY OF ANALYTICAL METHODS
APRIL/MAY 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Parameter</i>	<i>Analytical Method</i> ¹
Volatile Organic Compounds	SW-846 8260B
Semivolatile Organic Compounds	SW-846 8270C
Metals	SW-846 6010B/6020/7470A
Total Cyanide	SW-846 9012A
Bromide, Chloride, Sulfate	EPA 300.0A

¹ Method references:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition with Updates I through IIIB.

EPA - "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

TABLE 3
SUMMARY OF SAMPLE DATA QUALIFIED FOR
METHOD BLANK CONTAMINATION
APRIL/MAY 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
bis(2-Ethylhexyl)phthalate	GW-WT114B-050109	6.3 U
Manganese	GW-WT104A-043009	15.0 U
	GW-WT113A-042909	15.0 U
	GW-WTJ2-050109	15.0 U
Potassium	GW-WT104A-043009	5000 U
	GW-WT117A-050409	5000 U
Thallium	GW-WT104A-043009	1.0 U
	GW-WT106A-043009	1.0 U
	GW-WT113A-042909	1.0 U
	GW-WT113B-042909	1.0 U
	GW-WT114A-043009	1.0 U
Zinc	GW-WT102A-042909	20.0 U
	GW-WT102B-042909	20.0 U
	GW-WT102B-042909-D	20.0 U
	GW-WT102C-042909	20.0 U
	GW-WT104A-043009	20.0 U
	GW-WT105A-043009	20.0 U
	GW-WT106A-043009	20.0 U
	GW-WT112A-042909	20.0 U
	GW-WT112B-042909	20.0 U
	GW-WT113A-042909	20.0 U
	GW-WT113B-042909	20.0 U
	GW-WT114A-043009	20.0 U
	GW-WT114B-050109	20.0 U
	GW-WT115A-050609	59.6 U
	GW-WT115A-050609-D	57.2 U
	GW-WTB1-050609	43.6 U

¹ The sample results are qualified as:
U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 4

**SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
CONTINUING CALIBRATION VERIFICATION ACCEPTANCE CRITERIA
APRIL/MAY 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualifier</i> ¹
Potassium	GW-WT103A-050609	J
	GW-WT115A-050609	J
	GW-WT116B-050609	J
	GW-WTB1-050609	J
	GW-WTB3-050609	J
	GW-WTB4-050609	J

¹ The sample results are qualified as:
J - The associated value is an estimated quantity.

TABLE 5

SUMMARY OF DETECTED ANALYTES

FIELD DUPLICATE SAMPLES

APRIL/MAY 2009 GROUNDWATER MONITORING EVENT

HIMCO SITE

ELKHART, INDIANA

<i>Analyte</i>	<i>Investigative Sample GW-WT102B-042909</i>	<i>Field Duplicate Sample GW-WT102B-042909-D</i>	<i>RPD¹</i>
Calcium	57,300	53,100	7.6
Iron	564	541	4.2
Sodium	25,000	26,100	4.3

<i>Analyte</i>	<i>Investigative Sample GW-WT115A-050609</i>	<i>Field Duplicate Sample GW-WT115A-050609-D</i>	<i>RPD</i>
Aluminum	21,000	19,300	8.4
Calcium	28,400	28,100	1.1
Iron	6,830	6,350	7.3
Sulfate	10.9	11.1	1.8

¹ RPD - Relative Percent Difference



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MEMORANDUM

TO: Denise Quigley

FROM: Steve Day/br/11 *S. Day*

C.C.: Alan Deal

RE: Data Quality Assessment and Validation
August 2009 Groundwater Monitoring Event
Himco Site
Elkhart, Indiana

REF. NO.: 039611

DATE: June 4, 2010

The following summarizes the data quality assessment and validation conducted for the samples collected during the groundwater monitoring event conducted in August 2009 at the Himco Site in Elkhart, Indiana. The samples identified in Table 1 were analyzed for U.S. EPA's Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), U.S. EPA's Target Analyte List (TAL) metals, total cyanide, and anions (bromide, chloride, and sulfate) by TestAmerica Laboratories, Inc. of North Canton, Ohio. The methods of analysis are presented in Table 2. The data quality evaluation criteria were established by the site-specific quality assurance project plan (QAPP).¹

Sample Receipt and Holding Time Period Compliance

All samples were received by the laboratory intact, properly preserved, with appropriate chain-of-custody documentation, and within the proper temperature range. All samples were prepared and analyzed within the holding time periods specified in the QAPP.

Method Blank Sample Data

Method blank sample data were evaluated to verify that analytes detected in the investigative samples were not attributable to laboratory conditions or procedures. Acetone, bis(2-ethylhexyl)phthalate, aluminum, antimony, manganese, potassium, and zinc were detected at estimated concentrations (i.e., less than their respective reporting limits) in method blank samples associated with certain investigative samples. Investigative sample results that were qualified as non-detected for method blank contamination are presented in Table 3. The remaining method blank samples did not contain target analytes or the concentrations of target analytes in the investigative samples were greater than five times (ten times for common laboratory contaminants) their concentrations in the associated method blank samples. Qualification of the investigative sample data is not required in this instance.

¹ Application of data quality evaluation criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540-R-04-004, October 2004.

Surrogate Compounds Data

Method performance on individual samples analyzed for VOCs and SVOCs was evaluated by the percent recovery data of surrogate compounds added to each sample prior to analysis. The VOC and SVOC surrogate compounds percent recovery acceptance criteria were achieved for all samples.

Laboratory Control Sample Analyses

Analytical accuracy was evaluated by percent recovery data from laboratory control sample (LCS) analyses. Duplicate laboratory control sample (LCS/LCSD) percent recovery and relative percent difference (RPD) data were evaluated to assess the accuracy and precision of laboratory sample batches without project-specific matrix spike/matrix spike duplicate (MS/MSD) samples. The LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix for anions analyses were evaluated by the percent recovery and RPD data from matrix spike/matrix duplicate sample analyses. The sulfate percent recovery reported for the matrix spike analysis of sample GW-WT101B-080409 exceeded the upper percent recovery control limit, and the sulfate result for this sample was qualified as estimated (J). The remaining matrix spike percent recovery and all matrix duplicate RPD data were acceptable or unacceptable percent recovery and/or RPD data were not associated with the investigative samples.

Matrix Spike/Matrix Spike Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix were evaluated by the percent recovery and RPD data from MS/MSD sample analyses. The MS/MSD percent recovery and RPD data were acceptable or unacceptable MS/MSD data were from the analysis of MS/MSD samples that were not associated with the investigative samples.

Serial Dilution Sample Data

The laboratory noted in its case narrative that the potassium percent difference calculated from the serial dilution analysis conducted on sample GW-WT106A-080409 failed to achieve the acceptance criterion. The potassium result reported for this sample was qualified as estimated (J).

Sample Quantitation

VOC and SVOC results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "J" qualifier. Metals, total cyanide, and anions results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "B" qualifier. Results flagged as such are estimated concentrations, and the data validation "J" qualifier was applied to these results during the data validation process.

Field Quality Control Sample Analyses

The field quality control samples collected during the sampling event consisted of field equipment rinsate blank, trip blank, and field duplicate samples.

The effectiveness of the field decontamination procedure was evaluated by the data from the analysis of field equipment rinsate blank samples. Field equipment rinsate blank sample W-WT114A-080409-E contained calcium, manganese, and zinc at estimated concentrations of 428 µg/L, 1.0 µg/L, and 19.7 µg/L, respectively. Only zinc was detected in the associated investigative samples at similar estimated concentrations. Zinc results that were qualified as non-detected for field equipment rinsate blank contamination are presented in Table 4. Additional analytes detected in the field equipment rinsate blank samples did not result in qualification of the investigative sample data.

Field duplicate samples were collected to assess the overall precision of the sampling and analysis event. The QAPP requires evaluation of duplicate sample data when the concentrations of analytes detected in both the investigative and field duplicate samples are greater than five times their respective reporting limits. The RPDs calculated from these data are required to be within 50%. Table 5 summarizes the results of, and RPDs calculated for, the investigative and field duplicate samples that met the QAPP-specified evaluation criteria. As shown in Table 5, all RPD data were acceptable, indicating overall precision for the sampling and analysis event also was acceptable.

Sample cross-contamination by VOCs during sample transportation and storage was evaluated by the data from trip blank samples that were submitted to the laboratory for analysis with the investigative groundwater samples. Analytes detected in trip blank samples did not result in qualification of the investigative sample data.

Completeness

Completeness, as determined by the total number of usable results versus the total number of results, was required to be 90% or greater. All data were usable, and the completeness goal was attained.

Overall Assessment

The sample data are suitable for their intended use with the qualifications noted herein.

TABLE 1

**SAMPLE IDENTIFICATION NUMBERS
AUGUST 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

GW-WT106A-080409	GW-WT116B-080609
GW-WT105A-080409	GW-WT103A-080609
GW-WT117A-080409	GW-WTB3-080609
GW-WT117B-080409	GW-WTB4-080609
GW-WT114A-080409	GW-WTB1-080609
GW-WT114B-080409	TRIP BLANK-080609-3
W-WT114A-080409-E	GW-WT104A-081709
GW-WT111A-080409	GW-WT104A-081709-D
GW-WT118B-080409	GW-WTJ2-081709
GW-WT118B-080409-D	GW-WTJ1-081709
GW-WT101A-080409	GW-WTJ3-081709
GW-WT101B-080409	GW-WT113A-081809
TRIPBLANK-080409-1	GW-WT113B-081809
GW-WT101C-080509	GW-WT112A-081809
GW-WTE1-080509	GW-WT112B-081809
GW-WTE3-080509	GW-WT102A-081809
GW-WT115A-080509	GW-WT102B-081809
W-WT115A-080509-E	GW-WT102C-081809
GW-WT116A-080509	TRIPBLANK-081709-4
TRIP BLANK-080509-2	

TABLE 2

SUMMARY OF ANALYTICAL METHODS
AUGUST 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Parameter</i>	<i>Analytical Method</i> ¹
Volatile Organic Compounds	SW-846 8260B
Semivolatile Organic Compounds	SW-846 8270C
Metals	SW-846 6010B/6020/7470A
Total Cyanide	SW-846 9012A
Bromide, Chloride, Sulfate	EPA 300.0A

¹ Method references:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition with Updates I through IIIB.

EPA - "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

TABLE 3

**SUMMARY OF SAMPLE DATA QUALIFIED FOR
METHOD BLANK CONTAMINATION
AUGUST 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Acetone	GW-WT101C-080509	10 U
	GW-WT115A-080509	10 U
	GW-WT116A-080509	10 U
	GW-WTE1-080509	10 U
	GW-WTE3-080509	10 U
	GW-WT103A-080609	10 U
	GW-WTB1-080609	10 U
	GW-WTB3-080609	10 U
	GW-WTB4-080609	10 U
bis(2-Ethylhexyl)phthalate	GW-WT101A-080409	2.0 U
	GW-WT105A-080409	2.0 U
	GW-WT106A-080409	2.0 U
	GW-WT111A-080409	2.0 U
	GW-WT114B-080409	2.0 U
	GW-WT117A-080409	2.9 U
	GW-WT117B-080409	2.0 U
	GW-WT118B-080409	2.0 U
	GW-WT118B-080409-D	2.0 U
Aluminum	GW-WT101A-080409	50.0 U
	GW-WT101B-080409	50.0 U
	GW-WT105A-080409	65.0 U
	GW-WT106A-080409	50.0 U
	GW-WT103A-080609	68.3 U
	GW-WT116B-080609	55.9 U
	GW-WTB1-080609	51.5 U
	GW-WTB3-080609	55.7 U
	GW-WTB4-080609	56.5 U
Antimony	GW-WT115A-080509	2.0 U
	GW-WT116A-080509	2.0 U
Manganese	GW-WT104A-081709-D	15.0 U

TABLE 3

SUMMARY OF SAMPLE DATA QUALIFIED FOR
METHOD BLANK CONTAMINATION
AUGUST 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Potassium	GW-WT117A-080409	5000 U
	GW-WT104A-081709	5000 U
	GW-WT104A-081709-D	5000 U
	GW-WTB4-080609	5000 U
Zinc	GW-WTE1-080509	20.0 U
	GW-WTB1-080609	37.6 U

¹ The sample results are qualified as:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 4

**SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
FIELD EQUIPMENT RINSATE BLANK CONTAMINATION
AUGUST 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Zinc	GW-WT101B-080409	20.0 U
	GW-WT105A-080409	20.0 U
	GW-WT111A-080409	20.0 U
	GW-WT117A-080409	20.0 U

¹ The sample results are qualified as:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 5

SUMMARY OF DETECTED ANALYTES
 FIELD DUPLICATE SAMPLES
 AUGUST 2009 GROUNDWATER MONITORING EVENT
 HIMCO SITE
 ELKHART, INDIANA

<i>Analyte</i>	<i>Investigative Sample GW-WT104A-081709</i>	<i>Field Duplicate Sample GW-WT104A-081709-D</i>	<i>RPD¹</i>
Calcium	23,700	24,400	2.9
Chloride	1.0	1.0	0
Magnesium	5,380	5,540	2.9
Sulfate	7.2	7.1	1.4

<i>Analyte</i>	<i>Investigative Sample GW-WT118B-080409</i>	<i>Field Duplicate Sample GW-WT118B-080409-D</i>	<i>RPD</i>
Arsenic	3.6	3.5	2.8
Calcium	155,000	153,000	1.3
Chloride	36.0	31.4	14
Iron	5,190	5,160	0.6
Magnesium	17,000	16,900	0.6
Manganese	133	131	1.5
Sodium	21,500	21,300	0.9
Sulfate	182	182	0

¹ RPD - Relative Percent Difference



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MEMORANDUM

TO: Denise Quigley

FROM: Steve Day/br/10 *S. Day*

C.C.: Alan Deal

RE: Data Quality Assessment and Validation
April/May 2009 Groundwater Monitoring Event
Himco Site
Elkhart, Indiana

REF. NO.: 039611

DATE: June 4, 2010

*Insert into
Appendix C*

The following summarizes the data quality assessment and validation collected during the groundwater monitoring event conducted in April and Elkhart, Indiana. The samples identified in Table 1 were analyzed for U.S. 1 (CL) volatile organic compounds (VOCs), TCL semivolatile organic compounds, U.S. EPA's Target Analyte List (TAL) metals, total cyanide, and anions (bromide, chloride, and sulfate) by TestAmerica Laboratories, Inc. of North Canton, Ohio. The methods of analysis are presented in Table 2. The data quality evaluation criteria were established by the site-specific quality assurance project plan (QAPP).¹

Sample Receipt and Holding Time Period Compliance

All samples were received by the laboratory intact, properly preserved, with appropriate chain-of-custody documentation, and within the proper temperature range. All samples were prepared and analyzed within the holding time periods specified in the QAPP.

Method Blank Sample Data

Method blank sample data were evaluated to verify that analytes detected in the investigative samples were not attributable to laboratory conditions or procedures. Manganese, potassium, thallium, zinc, and bis(2-ethylhexyl)phthalate were detected at estimated concentrations (i.e., less than their respective reporting limits) in method blank samples associated with certain investigative samples. Investigative sample results that were qualified as non-detected for method blank contamination are presented in Table 3. The remaining method blank samples did not contain target analytes or the concentrations of target analytes in the investigative samples were greater than five times (ten times for common laboratory contaminants) their concentrations in the associated method blank samples. Qualification of the investigative sample data is not required in this instance.

¹ Application of data quality evaluation criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540-R-04-004, October 2004.

Continuing Calibration Verification Data

The laboratory noted in its case narrative that the percent recovery of a continuing calibration verification (CCV) standard associated with the potassium analysis of several investigative samples exceeded the upper percent recovery control limit (110%). The potassium CCV data were reviewed, and the percent recovery of the CCV standard noted by the laboratory was found to be 110.9%. Detected potassium results associated with this CCV standard were qualified as estimated (J), and the affected investigative samples are presented in Table 4. Qualification of non-detected potassium results is not required in this instance.

Surrogate Compounds Data

Method performance on individual samples analyzed for VOCs and SVOCs was evaluated by the percent recovery data of surrogate compounds added to each sample prior to analysis. The VOC and SVOC surrogate compounds percent recovery acceptance criteria were achieved for all samples.

Laboratory Control Sample Analyses

Analytical accuracy was evaluated by percent recovery data from laboratory control sample (LCS) analyses. Duplicate laboratory control sample (LCS/LCSD) percent recovery and relative percent difference (RPD) data were evaluated to assess the accuracy and precision of laboratory sample batches without project-specific matrix spike/matrix spike duplicate (MS/MSD) samples. The LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix for anions analyses were evaluated by the percent recovery and RPD data from matrix spike/matrix duplicate sample analyses. All matrix spike percent recovery and matrix duplicate RPD data were acceptable or unacceptable percent recovery and/or RPD data were not associated with the investigative samples.

Matrix Spike/Matrix Spike Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix were evaluated by the percent recovery and RPD data from MS/MSD sample analyses. The MS/MSD percent recovery and RPD data were acceptable or unacceptable MS/MSD data were from the analysis of MS/MSD samples that were not associated with the investigative samples.

Sample Quantitation

VOC and SVOC results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "J" qualifier. Metals, total cyanide, and anions results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "B" qualifier. Results flagged as such are estimated concentrations, and the data validation "J" qualifier was applied to these results during the data validation process.

Field Quality Control Sample Analyses

The field quality control samples collected during the sampling event consisted of field equipment rinsate blank, trip blank, and field duplicate samples.



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MEMORANDUM

TO: Denise Quigley

FROM: Steve Day/br/12 *S. Day*

C.C.: Alan Deal

RE: Data Quality Assessment and Validation
November 2009 Groundwater Monitoring Event
Himco Site
Elkhart, Indiana

REF. NO.: 039611

DATE: June 7, 2010

The following summarizes the data quality assessment and validation conducted for the samples collected during the groundwater monitoring event conducted in November 2009 at the Himco Site in Elkhart, Indiana. The samples identified in Table 1 were analyzed for U.S. EPA's Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), U.S. EPA's Target Analyte List (TAL) metals, total cyanide, and anions (bromide, chloride, and sulfate) by TestAmerica Laboratories, Inc. of North Canton, Ohio. The methods of analysis are presented in Table 2. The data quality evaluation criteria were established by the site-specific quality assurance project plan (QAPP).¹

Sample Receipt and Holding Time Period Compliance

All samples were received by the laboratory intact, properly preserved, with appropriate chain-of-custody documentation, and within the proper temperature range. All samples were prepared and analyzed within the holding time periods specified in the QAPP.

Method Blank Sample Data

Method blank sample data were evaluated to verify that analytes detected in the investigative samples were not attributable to laboratory conditions or procedures. Aluminum, manganese, potassium, and zinc were detected at estimated concentrations (i.e., less than their respective reporting limits) in method blank samples associated with certain investigative samples. Investigative sample results that were qualified as non-detected for method blank contamination are presented in Table 3. The remaining method blank samples did not contain target analytes or the concentrations of target analytes in the investigative samples were greater than five times (ten times for common laboratory contaminants) their concentrations in the associated method blank samples. Qualification of the investigative sample data is not required in this instance.

¹ Application of data quality evaluation criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540-R-04-004, October 2004.

Surrogate Compounds Data

Method performance on individual samples analyzed for VOCs and SVOCs was evaluated by the percent recovery data of surrogate compounds added to each sample prior to analysis. The VOC and SVOC surrogate compounds percent recovery acceptance criteria were achieved for all samples.

Laboratory Control Sample Analyses

Analytical accuracy was evaluated by percent recovery data from laboratory control sample (LCS) analyses. Duplicate laboratory control sample (LCS/LCSD) percent recovery and relative percent difference (RPD) data were evaluated to assess the accuracy and precision of laboratory sample batches without project-specific matrix spike/matrix spike duplicate (MS/MSD) samples. The LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix for anions analyses were evaluated by the percent recovery and RPD data from matrix spike/matrix duplicate sample analyses. The sulfate and bromide percent recoveries reported for the matrix spike analysis of sample GW-WT105A-110309 were less than their respective lower percent recovery control limits, and the sulfate and bromide results for this sample were qualified as estimated (J). The remaining matrix spike percent recovery and all matrix duplicate RPD data were acceptable or unacceptable percent recovery and/or RPD data were not associated with the investigative samples.

Matrix Spike/Matrix Spike Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix were evaluated by the percent recovery and RPD data from MS/MSD sample analyses. The chloride MS/MSD percent recoveries reported for MS/MSD sample GW-WT114B-110509 exceeded the upper percent recovery control limit, and the chloride result reported for this sample was qualified as estimated (J). The remaining MS/MSD percent recovery and RPD data were acceptable or unacceptable MS/MSD data were from the analysis of MS/MSD samples that were not associated with the investigative samples.

Sample Quantitation

VOC and SVOC results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "J" qualifier. Metals, total cyanide, and anions results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "B" qualifier. Results flagged as such are estimated concentrations, and the data validation "J" qualifier was applied to these results during the data validation process.

Field Quality Control Sample Analyses

The field quality control samples collected during the sampling event consisted of field equipment rinsate blank, trip blank, and field duplicate samples.

The effectiveness of the field decontamination procedure was evaluated by the data from the analysis of field equipment rinsate blank samples. Field equipment rinsate blank sample GW-WT116B-111009-E contained chloroform, potassium, and sulfate at estimated concentrations of 0.28 µg/L, 169 µg/L, and 0.30 mg/L, respectively. In addition, total cyanide was detected at a concentration of 0.021 mg/L. Chloroform, sulfate, and total cyanide were detected in certain associated investigative samples at similar concentrations. The associated investigative sample results that were qualified as non-detected for field equipment rinsate blank contamination are presented in Table 4. Additional analytes detected in the field equipment rinsate blank samples did not result in qualification of the investigative sample data.

Field duplicate samples were collected to assess the overall precision of the sampling and analysis event. The QAPP requires evaluation of duplicate sample data when the concentrations of analytes detected in both the investigative and field duplicate samples are greater than five times their respective reporting limits. The RPDs calculated from these data are required to be within 50%. Table 5 summarizes the results of, and RPDs calculated for, the investigative and field duplicate samples that met the QAPP-specified evaluation criteria. As shown in Table 5, all RPD data were acceptable, indicating overall precision for the sampling and analysis event also was acceptable.

Sample cross-contamination by VOCs during sample transportation and storage was evaluated by the data from trip blank samples that were submitted to the laboratory for analysis with the investigative groundwater samples. Analytes detected in trip blank samples did not result in qualification of the investigative sample data.

Completeness

Completeness, as determined by the total number of usable results versus the total number of results, was required to be 90% or greater. All data were usable, and the completeness goal was attained.

Overall Assessment

The sample data are suitable for their intended use with the qualifications noted herein.

TABLE 1

**SAMPLE IDENTIFICATION NUMBERS
NOVEMBER 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

GW-WT106A-110309	GW-WTJ1-110509
GW-WT105A-110309	GW-WTJ2-110509
GW-WT104A-110309	TRIP BLANK-110509-002
GW-WT117B-110309	GW-WT115A-110609
GW-WT117A-110309	GW-WT115A-110609-D
GW-WT117A-110309-D	TRIP BLANK-110609-003
GW-WT111A-110309	GW-WT101A-110909
GW-WT118B-110309	GW-WT101B-110909
GW-WT102C-110409	GW-WT101C-110909
GW-WT102B-110409	TRIP BLANK-110909-004
GW-WT102A-110409	GW-WTE1-111009
GW-WT112B-110409	GW-WTE3-111009
GW-WT112A-110409	GW-WT116A-111009
GW-WT113A-110409	GW-WT116B-111009
TRIP BLANK-110309-001	GW-WT116B-111009-E
GW-WT113B-110509	GW-WT103A-111009
GW-WT113B-110509-E	GW-WTB3-111109
GW-WT114B-110509	GW-WTB4-111109

TABLE 2

SUMMARY OF ANALYTICAL METHODS
NOVEMBER 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Parameter</i>	<i>Analytical Method</i> ¹
Volatile Organic Compounds	SW-846 8260B
Semivolatile Organic Compounds	SW-846 8270C
Metals	SW-846 6010B/6020/7470A
Total Cyanide	SW-846 9012A
Bromide, Chloride, Sulfate	EPA 300.0A

¹ Method references:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition with Updates I through IIIB.

EPA - "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

TABLE 3

**SUMMARY OF SAMPLE DATA QUALIFIED FOR
METHOD BLANK CONTAMINATION
NOVEMBER 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Aluminum	GW-WT101A-110909	50.0 U
	GW-WT101C-110909	50.0 U
	GW-WT103A-111009	50.0 U
Manganese	GW-WTJ2-110509	15.0 U
Potassium	GW-WT104A-110309	5000 U
	GW-WTB4-111109	5000 U
Zinc	GW-WT115A-110609	23.0 U
	GW-WT115A-110609-D	20.0 U
	GW-WTB1-111109	40.6 U
	GW-WTJ1-110509	20.0 U
	GW-WTJ3-110509	20.0 U

¹ The sample results are qualified as:
U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 4

SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
FIELD EQUIPMENT RINSATE BLANK CONTAMINATION
NOVEMBER 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Chloroform	GW-WTE3-111009	1.0 U
Cyanide (total)	GW-WT103A-111009	0.023 U
Sulfate	GW-WT101C-110909	1.0 U

¹ The sample results are qualified as:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 5

SUMMARY OF DETECTED ANALYTES
FIELD DUPLICATE SAMPLES
NOVEMBER 2009 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Investigative Sample GW-WT115A-110609</i>	<i>Field Duplicate Sample GW-WT115A-110609-D</i>	<i>RPD¹</i>
1,1-Dichloroethane	4.1	3.9	5.0
Aluminum	3,880	4,060	4.5
Arsenic	1.6	1.6	0
Benzene	12	12	0
Calcium	355,000	347,000	2.3
Carbon disulfide	2.5	3.4	31
Chloride	13.1	12.9	1.5
Iron	2,910	4,230	37
Magnesium	16,000	15,700	1.9
Manganese	143	146	2.1
Potassium	5,210	5,100	2.1
Sodium	22,500	22,200	1.3
Sulfate	314	310	1.3

<i>Analyte</i>	<i>Investigative Sample GW-WT117A-110309</i>	<i>Field Duplicate Sample GW-WT117A-110309-D</i>	<i>RPD</i>
Aluminum	931	1,000	7.1
Calcium	58,700	55,700	5.2
Chloride	2.4	2.4	0
Iron	474	471	0.6
Magnesium	7,550	7,270	3.8
Manganese	184	170	7.9
Sodium	7,210	6,630	8.4
Sulfate	26.5	26.7	0.8

¹ RPD - Relative Percent Difference



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MEMORANDUM

TO: Denise Quigley REF. NO.: 039611
FROM: Steve Day/br/13 *S. Day* DATE: June 7, 2010
C.C.: Alan Deal
RE: Data Quality Assessment and Validation
February/March 2010 Groundwater Monitoring Event
Himco Site
Elkhart, Indiana

The following summarizes the data quality assessment and validation conducted for the samples collected during the groundwater monitoring event conducted in February and March 2010 at the Himco Site in Elkhart, Indiana. The samples identified in Table 1 were analyzed for U.S. EPA's Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), U.S. EPA's Target Analyte List (TAL) metals, total cyanide, and anions (bromide, chloride, and sulfate) by TestAmerica Laboratories, Inc. of North Canton, Ohio. The methods of analysis are presented in Table 2. The data quality evaluation criteria were established by the site-specific quality assurance project plan (QAPP).¹

Sample Receipt and Holding Time Period Compliance

All samples were received by the laboratory intact, properly preserved, with appropriate chain-of-custody documentation, and within the proper temperature range. All samples were prepared and analyzed within the holding time periods specified in the QAPP.

Method Blank Sample Data

Method blank sample data were evaluated to verify that analytes detected in the investigative samples were not attributable to laboratory conditions or procedures. Methylene chloride, barium, and zinc were detected at estimated concentrations (i.e., less than their respective reporting limits) in method blank samples associated with certain investigative samples. Investigative sample results that were qualified as non-detected for method blank contamination are presented in Table 3. The remaining method blank samples did not contain target analytes or the concentrations of target analytes in the investigative samples were greater than five times (ten times for common laboratory contaminants) their concentrations in the associated method blank samples. Qualification of the investigative sample data is not required in this instance.

¹ Application of data quality evaluation criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540-R-04-004, October 2004.

Surrogate Compounds Data

Method performance on individual samples analyzed for VOCs and SVOCs was evaluated by the percent recovery data of surrogate compounds added to each sample prior to analysis. The VOC and SVOC surrogate compounds percent recovery acceptance criteria were achieved for all samples.

Laboratory Control Sample Analyses

Analytical accuracy was evaluated by percent recovery data from laboratory control sample (LCS) analyses. Duplicate laboratory control sample (LCS/LCSD) percent recovery and relative percent difference (RPD) data were evaluated to assess the accuracy and precision of laboratory sample batches without project-specific matrix spike/matrix spike duplicate (MS/MSD) samples. The LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix for anions analyses were evaluated by the percent recovery and RPD data from matrix spike/matrix duplicate sample analyses. All matrix spike percent recovery and matrix duplicate RPD data were acceptable or unacceptable percent recovery and/or RPD data were not associated with the investigative samples.

Matrix Spike/Matrix Spike Duplicate Sample Analyses

Accuracy and precision relative to the sample matrix were evaluated by the percent recovery and RPD data from MS/MSD sample analyses. The chloride and iron percent recovery data reported for two MS/MSD samples failed to achieve the acceptance criteria. Investigative sample data qualified for MS/MSD acceptance criteria violation are presented in Table 4. The remaining MS/MSD percent recovery and RPD data were acceptable or unacceptable MS/MSD data were from the analysis of MS/MSD samples that were not associated with the investigative samples.

Serial Dilution Sample Data

The laboratory noted in its case narrative that the potassium, sodium, and zinc percent differences for the serial dilution analyses conducted on two investigative samples failed to achieve the acceptance criteria. Investigative sample data qualified for serial dilution percent difference acceptance criteria violation are presented in Table 5.

Sample Quantitation

VOC and SVOC results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "J" qualifier. Metals, total cyanide, and anions results reported at concentrations less than their respective sample-specific reporting limits but greater than or equal to their respective method detection limits were flagged by the laboratory with the "B" qualifier. Results flagged as such are estimated concentrations, and the data validation "J" qualifier was applied to these results during the data validation process.

Field Quality Control Sample Analyses

The field quality control samples collected during the sampling event consisted of field equipment rinsate blank, trip blank, and field duplicate samples.

The effectiveness of the field decontamination procedure was evaluated by the data from the analysis of field equipment rinsate blank samples. Field equipment rinsate blank sample GW-WT115A-030210-E contained estimated concentrations of aluminum, calcium, chloride, magnesium, manganese, vanadium, and zinc. The estimated concentrations of aluminum (23.8 µg/L), vanadium (0.67 µg/L), and zinc (5.3 µg/L) in this equipment rinsate blank sample were similar to the concentrations of these metals in certain associated investigative samples. The associated investigative sample results qualified as non-detected for field equipment rinsate blank contamination are presented in Table 6. Additional analytes detected in the field equipment rinsate blank samples did not result in qualification of the investigative sample data.

Field duplicate samples were collected to assess the overall precision of the sampling and analysis event. The QAPP requires evaluation of duplicate sample data when the concentrations of analytes detected in both the investigative and field duplicate samples are greater than five times their respective reporting limits. The RPDs calculated from these data are required to be within 50%. Table 7 summarizes the results of, and RPDs calculated for, the investigative and field duplicate samples that met the QAPP-specified evaluation criteria. As shown in Table 7, all RPD data were acceptable, indicating overall precision for the sampling and analysis event also was acceptable.

Sample cross-contamination by VOCs during sample transportation and storage was evaluated by the data from trip blank samples that were submitted to the laboratory for analysis with the investigative groundwater samples. Analytes detected in trip blank samples did not result in qualification of the investigative sample data.

Completeness

Completeness, as determined by the total number of usable results versus the total number of results, was required to be 90% or greater. All data were usable, and the completeness goal was attained.

Overall Assessment

The sample data are suitable for their intended use with the qualifications noted herein.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS

FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT

HIMCO SITE

ELKHART, INDIANA

GW-WT117A-022310	GW-WT111A-030110
GW-WT117B-022310	GW-WT118B-030110
GW-WT104A-022310	GW-WT101A-030210
GW-WT113A-022410	GW-WT101B-030210
GW-WT113B-022410	GW-WT101C-030210
GW-WT112B-022410	GW-WT115A-030210
GW-WT112B-022410-E	GW-WT115A-030210-E
GW-WT112A-022410	GW-WTE1-030210
GW-WT112A-022410-D	GW-WTE1-030210-D
GW-WT102A-022410	GW-WTE3-030210
GW-WT102B-022510	TRIP BLANK-030110-003
GW-WT102C-022510	GW-WT116A-030310
GW-WT114A-022510	GW-WT116B-030310
GW-WT114B-022510	GW-WT103A-030310
TRIP BLANK-022310-001	GW-WTB4-030310
GW-WT105A-022610	GW-WTB3-030310
GW-WT106A-022610	GW-WTB1-030410
TRIP BLANK-022610-002	TRIP BLANK-030310-004

TABLE 2

SUMMARY OF ANALYTICAL METHODS
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Parameter</i>	<i>Analytical Method</i> ¹
Volatile Organic Compounds	SW-846 8260B
Semivolatile Organic Compounds	SW-846 8270C
Metals	SW-846 6010B/6020/7470A
Total Cyanide	SW-846 9012A
Bromide, Chloride, Sulfate	EPA 300.0A

¹ Method references:
SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846,
3rd Edition with Updates I through IIIB.
EPA - "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020,
March 1983 and subsequent revisions.

TABLE 3

**SUMMARY OF SAMPLE DATA QUALIFIED FOR
METHOD BLANK CONTAMINATION
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Methylene chloride	GW-WT106A-022610	1.0 U
	GW-WT116B-030310	1.0 U
Barium	GW-WT104A-022310	200 U
Zinc	GW-WT102A-022410	20.0 U
	GW-WT102B-022510	20.0 U
	GW-WT102C-022510	20.0 U
	GW-WT117A-022310	22.2 U
	GW-WT105A-022610	20.0 U
	GW-WT106A-022610	20.0 U

¹ The sample results are qualified as:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 4

**SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
MATRIX SPIKE/MATRIX SPIKE DUPLICATE ACCEPTANCE CRITERIA
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualifier¹</i>
Chloride	GW-WT103A-030310	J
	GW-WT116A-030310	J
	GW-WT116B-030310	J
	GW-WTB1-030410	J
	GW-WTB3-030310	J
	GW-WTB4-030310	J
Iron	GW-WT101A-030210	J
	GW-WT101B-030210	J
	GW-WT101C-030210	J
	GW-WT115A-030210	J
	GW-WT118B-030110	J
	GW-WT111A-030110	J
	GW-WTE1-030210	J
	GW-WTE1-030210-D	J
	GW-WTE3-030210	J

¹ The sample results are qualified as:

J - The associated value is an estimated quantity.

TABLE 5

**SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
SERIAL DILUTION PERCENT DIFFERENCE ACCEPTANCE CRITERIA
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualifier</i> ¹
Potassium	GW-WT111A-030110	J
Sodium	GW-WT111A-030110	J
Zinc	GW-WT116A-030310	J

¹ The sample results are qualified as:
J - The associated value is an estimated quantity.

TABLE 6

SUMMARY OF SAMPLE DATA QUALIFIED FOR VIOLATION OF
FIELD EQUIPMENT RINSATE BLANK CONTAMINATION
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Associated Samples</i>	<i>Qualified Result</i> ¹
Aluminum	GW-WT101C-030210	50.0 U
Vanadium	GW-WT101A-030210	50.0 U
	GW-WT111A-030110	50.0 U
Zinc	GW-WT101C-030210	20.0 U
	GW-WT111A-030110	20.0 U
	GW-WTE1-030210	20.0 U

¹ The sample results are qualified as:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 7
SUMMARY OF DETECTED ANALYTES
FIELD DUPLICATE SAMPLES
FEBRUARY/MARCH 2010 GROUNDWATER MONITORING EVENT
HIMCO SITE
ELKHART, INDIANA

<i>Analyte</i>	<i>Investigative Sample GW-WT112A-022410</i>	<i>Field Duplicate Sample GW-WT112A-022410-D</i>	<i>RPD¹</i>
Magnesium	17,100	16,900	1.2
Sodium	11,300	10,900	3.6
Calcium	311,000	314,000	1.0
Chloride	31.5	30.9	1.9
Sulfate	758	762	0.5

<i>Analyte</i>	<i>Investigative Sample GW-WTE1-030210</i>	<i>Field Duplicate Sample GW-WTE1-030210-D</i>	<i>RPD</i>
Calcium	96,300	94,000	2.4
Chloride	35.3	35.3	0
Iron	176	188	6.6
Magnesium	16,100	15,700	2.5
Manganese	168	163	3.0
Sodium	17,000	16,400	3.6
Sulfate	88.1	87.9	0.2

¹ RPD - Relative Percent Difference

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APPENDIX D

GROUNDWATER SAMPLING STABILIZATION PARAMETERS

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:	WT101A	WT101A	WT101A	WT101A	WT101B	WT101B	WT101B	WT101B	WT101B	WT101C	WT101C	WT101C	WT101C	WT101C	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102B	WT102B	WT102B	WT102B	WT102B	WT102B
Sample Date:	2/11/2009	5/5/2009	8/4/2009	3/2/2010	11/4/2008	2/11/2009	5/5/2009	8/4/2009	3/2/2010	11/4/2008	2/12/2009	5/5/2009	8/5/2009	3/2/2010	10/30/2008	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/24/2010	10/30/2008	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/25/2010	
Parameter	Units																										
Field Parameters																											
Color	none	clear	clear	clear	clear	clear	clear	clear	clear	clear	milky	clear	sl. Cloudy	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear
Conductivity Field	mS/cm	1.234	1.090	1.170	1.730	0.908	0.771	0.762	0.780	-243	0.445	0.329	0.335	0.439	0.452	0.869	0.620	0.514	0.649	0.935	1.050	0.538	0.448	0.400	0.451	0.582	0.634
Dissolved Oxygen, Field	mg/L	0.71	1.47	0.41	0.72	1.00	0.16	0.53	0.65	0.25	0.39	0.58	0.47	0.94	0.34	1.60	1.97	2.13	3.60	2.44	1.26	0.22	0.50	0.40	0.46	0.21	0.20
ORP, Field	millivolts	-75.5	39.3	-80.6	-122	106.2	-248.1	-152.5	-121.3	1.010	-186.7	-152.4	-127.5	-151.1	-258	-55.5	23.1	-9.2	-20.1	6.5	13	-195.4	-122.1	-171.9	-158.8	-72.9	-207
pH Field	s.u.	6.43	6.31	7.10	6.84	9.63	6.63	6.65	7.38	7.45	8.49	7.41	7.23	7.37	7.91	7.07	6.63	7.35	7.49	NA	7.41	7.61	7.20	7.63	7.72	NA	7.66
Temperature, Field	Deg C	10.88	10.62	16.20	10.45	12.65	11.27	13.53	13.07	10.45	13.00	11.41	12.95	11.79	11.27	13.04	9.20	9.29	13.15	13.25	10.07	11.37	11.35	11.40	12.86	11.87	10.30
Turbidity (Field)	NTU	2.12	2.02	3.85	4.03	7.15	4.17	-	4.48	4.03	39.5	20.9	46.5	4.70	3.31	4.09	4.91	8.41	1.06	2.36	2.44	2.22	1.63	2.19	1.52	1.13	3.09

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT102C	WT102C	WT102C	WT102C	WT102C	WT102C	WT103A	WT103A	WT103A	WT103A	WT103A	WT103A	WT103A	WT104A	WT104A	WT104A	WT104A	WT104A	WT104A	WT105A	WT105A	WT105A	WT105A	WT105A	WT105A	WT105A	WT106A	WT106A	WT106A	WT106A
Sample Date:		10/30/2008	2/18/2009	4/29/2009	8/18/2009	11/4/2009	2/25/2010	10/28/2008	2/16/2009	5/6/2009	8/6/2009	3/3/2010	10/28/2008	2/10/2009	4/30/2009	8/17/2009	2/23/2010	11/5/2008	2/10/2009	4/30/2009	8/4/2009	11/3/2009	2/26/2010	10/28/2008	2/10/2009	4/30/2009	8/4/2009				
Parameter	Units																														
Field Parameters																															
Color	none	clear	clear	clear	clear	clear	slightly cloudy	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	Particulates	clear	clear
Conductivity Field	mS/cm	0.52	0.407	0.409	0.434	0.5337	0.591	0.781	0.535	0.467	0.734	0.938	0.181	0.116	0.126	0.134	0.164	0.360	0.229	0.180	0.344	0.160	0.428	0.663	0.461	0.463	0.660				
Dissolved Oxygen, Field	mg/L	0.7	0.63	0.41	0.32	0.37	0.31	0.16	0.86	0.99	0.99	0.18	8.29	9.96	9.93	9.85	9.56	2.74	3.44	3.79	3.05	12.08	1.28	0.87	1.34	1.41	1.63				
ORP, Field	millivolts	-122.4	-23.6	-138.5	-150.6	-237.2	-206	-112.3	-35.9	-57.1	-80.5	-153	70.1	93.8	117.4	122.4	55.9	90.5	38.1	36.6	12.7	23.3	20	-51.5	-38.6	-15.7	-16.2				
pH Field	s.u.	9.67	8.23	8.19	8.84	9.26	8.28	7.10	7.50	7.35	7.20	7.55	7.67	7.36	6.60	7.31	8.80	7.39	6.58	7.05	7.80	8.09	7.53	6.92	7.04	7.29	7.18				
Temperature, Field	Deg C	12.08	11.12	11.58	13.84	11.52	10.62	18.6	5.40	8.51	15.55	6.06	15.33	9.75	8.92	15.79	9.06	14.83	9.75	8.92	15.31	14.96	8.81	13.04	10.41	10.10	13.68				
Turbidity (Field)	NTU	18.9	80.8	19.4	21.5	32.4	33.4	9.15	4.89	4.74	1.80	8.41	1.63	1.60	1.74	0.63	1.19	9.31	4.44	3.00	2.75	1.78	12.9	4.45	3.13	3.75	0.98				

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT106A	WT106A	WT111A	WT111A	WT111A	WT111A	WT111A	WT111A	WT112A	WT112A	WT112A	WT112A	WT112A	WT112A	WT112B	WT112B	WT112B	WT112B	WT112B	WT112B	WT112B	WT113A	WT113A	WT113A	WT113A	WT113A	WT113A	WT113B				
Sample Date:		11/3/2009	2/26/2010	2/13/2009	5/5/2009	8/4/2009	11/3/2009	3/1/2010	10/29/2008	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/24/2010	10/29/08	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/24/2010	10/29/2008	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/24/2010	10/29/2008	2/17/2009	4/29/2009	8/18/2009	11/4/2009	2/24/2010	10/29/2008
Parameter	Units																																
Field Parameters																																	
Color	none	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	
Conductivity Field	mS/cm	0.713	0.868	1.039	0.290	1.005	1.335	1.39	1.051	1.150	0.817	1.131	1.199	1.630	0.688	0.507	0.490	0.523	0.699	0.814	0.540	0.381	0.350	0.365	.457	0.547	0.554						
Dissolved Oxygen, Field	mg/L	1.25	0.90	1.10	3.59	0.68	0.34	0.33	2.80	4.83	3.41	4.90	3.63	1.94	0.23	0.60	0.81	0.33	0.33	0.14	3.85	4.36	5.01	4.92	4.8	2.95	0.27						
ORP, Field	millivolts	24.9	-94	-27.1	130.3	-112.1	-58.6	-127	43.6	23.8	8.2	8.1	-22.7	-71	-130.3	-106.3	-124.1	-120.7	-105.4	-217	74.6	124.3	76.4	109.4	11	73	-135.9						
pH Field	s.u.	7.01	7.32	6.21	5.68	6.80	6.49	6.61	7.20	7.36	7.26	7.27	NA	7.50	7.28	7.45	7.42	7.60	NA	7.67	7.32	7.46	7.20	6.81	NA	7.65	7.3						
Temperature, Field	Deg C	13.42	9.31	9.70	9.40	12.69	12.72	10.75	13.23	7.89	7.79	16.09	12.79	8.20	11.23	10.39	10.42	12.10	11.81	9.50	12.96	10.21	9.92	13.24	13.56	10.19	11.45						
Turbidity (Field)	NTU	1.16	1.54	13.3	21.9	335	3.99	4.13	3.84	1.50	4.08	3.89	2.83	1.92	2.61	0.82	1.13	4.11	1.53	0.78	1.21	2.40	2.17	0.78	3.17	1.21	1.15						

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT113B	WT113B	WT113B	WT113B	WT113B	WT114A	WT114A	WT114A	WT114A	WT114A	WT114B	WT114B	WT114B	WT114B	WT114B	WT114B	WT115A	WT115A	WT115A	WT115A	WT115A	WT115A	WT116A	WT116B	WT116B	WT116B
Sample Date:		2/17/09	4/29/2009	8/18/2009	8/18/2009	2/24/2010	11/3/2008	2/11/2009	4/30/2009	8/4/2009	2/25/2010	11/3/2008	2/11/2009	5/1/2009	8/4/2009	11/5/2009	2/25/2010	11/6/2008	2/12/2009	5/6/2009	8/5/2009	3/2/2010	8/5/2009	3/3/2010	2/12/2009	5/6/2009	8/6/2009
Parameter	Units																										
Field Parameters																											
Color	none	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	grey	grey	sl. Cloudy	cloudy	cloudy	clear	clear	clear	clear	clear
Conductivity Field	mS/cm	0.429	0.417	0.446	.574	0.619	1.271	1.123	1.282	1.765	1.830	0.659	0.542	0.484	0.624	.660	0.788	1.435	0.985	0.120	0.891	1.530	3.027	3.560	0.760	0.713	0.887
Dissolved Oxygen, Field	mg/L	0.61	0.62	0.46	.34	0.10	0.73	0.77	0.69	1.25	0.42	0.33	0.17	0.53	0.19	.31	0.45	0.72	0.56	0.96	0.95	0.53	0.93	0.35	0.44	0.81	1.35
ORP, Field	millivolts	-86.6	-111.2	-103.3	-82.3	-183	-72.8	-41.3	-19.1	-67.4	-97.2	-140.8	-116.2	-149.4	-216.2	124.7	-233	-130.4	-133.3	-84.4	-138.8	-200	-87.7	-94	-165.3	-197.7	-198.4
pH Field	s.u.	7.37	7.21	7.37	7.41	7.68	6.95	6.92	7.28	6.46	7.36	7.34	6.58	7.36	7.47	7.50	7.67	6.70	6.70	6.54	6.94	7.01	6.77	6.94	6.90	6.83	6.92
Temperature, Field	Deg C	10.59	11.02	12.63	11.47	10.07	14.82	11.40	11.41	13.58	11.06	13.40	11.62	12.48	13.54	12.61	11.06	14.73	9.30	10.17	15.38	10.18	12.77	9.51	11.93	12.63	12.94
Turbidity (Field)	NTU	1.59	1.81	0.67	1.00	2.41	9.15	3.11	4.69	0.61	4.61	3.68	1.89	-	0.80	1.31	2.33	190	6.03	72.9	79.9	49.4	4.73	4.22	2.15	0.73	0.68

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT116B	WT117A	WT117A	WT117A	WT117A	WT117A	WT117A	WT117B	WT117B	WT117B	WT117B	WT117B	WT117B	WT117B	WT118B	WT118B	WT118B	WT118B	WTB1	WTB1	WTB1	WTB1	WTB3	WTB3	WTB3	WTB3	WTB4
Sample Date:		3/3/2010	10/30/2008	2/10/2009	5/4/20089	8/4/2009	11/3/2009	2/23/2010	10/30/2008	2/10/2009	5/4/2009	8/4/2009	11/3/2009	2/23/2010	2/13/2009	5/5/2009	8/4/2009	11/3/2009	2/18/2009	5/6/2009	8/6/2009	3/4/2010	11/4/2008	5/6/2009	8/6/2009	3/3/2010	11/4/2008	
Parameter	Units																											
Field Parameters																												
Color	none	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	cloudy	clear	clear	clear	clear	
Conductivity Field	mS/cm	1.10	0.263	0.277	0.034	0.060	0.348	0.182	0.843	1.239	0.915	0.837	0.864	0.833	0.724	0.685	0.935	0.869	0.457	0.469	0.647	0.793	0.589	0.431	0.603	0.631	0.446	
Dissolved Oxygen, Field	mg/L	0.90	0.20	2.84	6.68	3.87	0.36	3.06	0.20	0.13	1.33	0.53	0.27	0.22	0.65	0.65	0.36	0.19	0.62	0.92	0.81	0.65	5.18	4.10	0.90	0.60	5.69	
ORP, Field	millivolts	-222	-89.0	134.3	178.2	128.0	12.6	141.9	-105.6	-95.1	21.5	-107.8	-82.9	-11.9	-164.3	-55.8	-198.4	-102.4	-71.1	-149.0	-209.4	-241	1.0	28.1	-53.0	-246	8.8	
pH Field	s.u.	7.10	6.91	6.51	6.22	6.07	6.52	6.33	7.16	6.27	6.41	7.17	8.60	6.95	6.80	6.51	7.05	6.99	7.39	7.39	7.75	7.70	7.89	7.29	7.60	7.70	8.05	
Temperature, Field	Deg C	11.74	15.40	9.85	10.45	13.81	15.16	9.38	12.62	11.10	12.35	13.04	11.72	11.16	11.15	11.98	12.80	11.84	9.10	11.36	12.60	9.11	12.48	12.30	13.42	9.36	12.36	
Turbidity (Field)	NTU	0.28	28.6	27.5	17.7	27.8	6.31	21.2	4.93	1.18	1.10	1.71	1.50	2.12	1.00	0.65	0.93	0.61	2.74	0.94	0.55	-	37.5	4.52	4.81	1.90	4.12	

TABLE D.1
GROUNDWATER SAMPLING STABILIZATION PARAMETERS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WTB4	WTB4	WTB4	WTB4	WTE1	WTE1	WTE1	WTE1	WTE1	WTE3	WTE3	WTE3	WTE3	WTE3	WTJ1	WTJ1	WTJ1	WTJ2	WTJ2	WTJ3	WTJ3	WTJ3
Sample Date:		2/18/2009	5/6/2009	8/6/2009	3/3/2010	11/4/2008	2/12/2009	5/6/2009	8/5/2009	3/2/2010	11/4/2008	2/12/2009	5/6/2009	8/5/2009	3/2/2010	2/16/2009	5/5/2009	8/17/2009	5/1/2009	8/17/2009	2/16/2009	5/5/2009	8/17/2009
Parameter	Units																						
Field Parameters																							
Color	none	clear	clear	clear	clear	-	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear
Conductivity Field	mS/cm	0.378	0.360	0.493	0.480	0.667	0.494	0.519	0.695	0.714	0.622	0.733	0.729	0.572	0.907	0.536	0.547	0.622	0.593	0.747	0.331	0.384	0.383
Dissolved Oxygen, Field	mg/L	0.5	0.90	1.25	0.16	0.47	1.40	1.23	1.13	0.29	0.55	0.52	0.90	0.99	0.29	0.66	0.70	0.43	2.53	0.92	0.68	0.75	0.37
ORP, Field	millivolts	-114.5	-215.5	-237.7	-302	-17.0	15.3	41.1	-176.3	-295	-112.8	-137.4	-245.3	-290.4	-293	-59.9	-17.1	-59.8	59.3	-29.5	-86.2	-28.5	-54.1
pH Field	s.u.	7.45	7.19	7.39	7.35	7.30	7.05	6.76	7.33	7.57	7.50	7.19	6.89	7.25	7.51	7.35	7.04	7.46	7.09	6.97	7.33	6.62	7.40
Temperature, Field	Deg C	10.96	11.90	12.80	10.04	14.35	11.45	12.43	14.26	12.63	15.22	10.86	12.60	15.76	10.81	13.45	15.53	16.47	12.39	18.72	10.61	17.57	15.71
Turbidity (Field)	NTU	10.8	1.02	0.84	-	110	14.5	9.35	1.34	0.82	19.0	2.45	1.25	1.18	2.25	4.31	4.89	2.54	10.7	1.98	10.12	4.62	9.78

APPENDIX E

BACKGROUND GROUNDWATER INVESTIGATION RESULTS

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has performed a statistical evaluation of observed concentrations of metals and general chemistry parameters in upgradient wells during groundwater monitoring at the HIMCO Site in Elkhart, Indiana (Site). The purpose of this evaluation was to calculate background values (BVs) against which downgradient well data could be compared. After calculating the BVs, CRA compared the 2009-2010 monitoring data from downgradient wells to the BVs. The results of this comparison are also provided in this memorandum. CRA also completed an assessment of concentration trends over time for select inorganics and volatile organic compounds (VOCs) for the 2008-2010 time period.

2.0 BACKGROUND VALUE CALCULATIONS

2.1 SCOPE OF BACKGROUND DATA

The groundwater monitored at the Site is divided into the Upper, Intermediate and Lower Aquifers. The monitoring network at the Site includes a nest of three wells (WT102A in the Upper Aquifer, WT102B in the Intermediate Aquifer, and WT102C in the Lower Aquifer) located upgradient of the Site, which provide background data representing groundwater conditions prior to on-Site influences. CRA used the monitoring data from these wells to calculate BVs for the Site. Consistent with United States Environmental Protection Agency (USEPA) guidance (USEPA, 2009a), BVs have been calculated separately for each aquifer.

All available historical groundwater monitoring data (1990-2010) for inorganics in the background wells were used for BV calculations. The number of samples varied from 12 from the Upper Aquifer well WT102A, to 10 samples from the Intermediate Aquifer well WT102B, to 7 samples in the Lower Aquifer well WT102C. Not all background samples were analyzed for all inorganics, which resulted in smaller background data sets for certain monitoring parameters. Table 1 presents the available background data. Monitoring frequencies have been irregular at the Site, with sampling events occurring in 1990, 1991 (two events), 1995, 1998, 2000, 2008, 2009 and 2010. Not all background wells were sampled in each of these years. It is preferable (USEPA, 2009b) to have 8-10 or more observations for BV calculations, and thus those BVs based on fewer samples represent interim values that may not capture the full extent of natural variability in background conditions (i.e., may potentially be biased conservatively low). Due to the low numbers of background data for the Lower Aquifer (4-7 points, depending on the monitoring parameter), a combined-background data set consisting of results from all three zones (i.e., wells WT102A in the Upper Aquifer, WT102B in the Intermediate Aquifer, and WT102C in the Lower Aquifer) was also considered. BVs for all monitoring parameters were calculated using this combined data set, which may be applied when the individual-aquifer upgradient data sets did not contain a sufficient number of samples for BV calculations.

The inorganic analytes (23) monitored at the Site for which BV calculations were performed include:

- | | | |
|------------|----------|-------------|
| • Aluminum | • Cobalt | • Potassium |
| • Antimony | • Copper | • Selenium |
| • Arsenic | • Iron | • Silver |
| • Barium | • Lead | • Sodium |

- Beryllium
- Cadmium
- Calcium
- Chromium (total)
- Magnesium
- Manganese
- Mercury
- Nickel
- Thallium
- Vanadium
- Zinc

The general chemistry parameters (4) monitored at the Site for which BV calculations were performed include:

- Bromide
- Chloride
- Cyanide (total)
- Sulfate

2.2 STATISTICAL METHODS

Methods for comparing downgradient wells vs. background conditions are presented in RCRA groundwater guidance (USEPA, 2009a; 1989). For the purposes of point-by-point comparisons of downgradient data vs. upgradient background conditions, statistical upper tolerance limits (UTLs) are recommended (USEPA, 2009a; 1989). Methods for calculating UTLs are available in USEPA (2009b; 2006; 1989), Hahn and Meeker (1991), and Guenther (1972). An UTL represents an upper limit, with specified confidence, (e.g., 95 percent), on a percentile of the population (e.g., 95th percentile of background). If an on-site observation exceeds the background UTL, it is unlikely to belong to the same population (i.e., the on-site sample concentration is greater than upgradient conditions).

For the purposes of this evaluation, UTLs on the 95th percentile of the upgradient population (with 95 percent confidence) were calculated as BVs for each inorganic analyte in each groundwater zone (Upper, Intermediate and Lower Aquifers), and for the combined-aquifer data set. By selecting this statistic for the BVs, there is 95 percent confidence that no more than one in twenty groundwater samples consistent with upgradient conditions would exceed the BV due to natural variation, and thus any on-site observations greater than the BV are likely due to an on-site effect. However, since the BVs represent a 1 in 20 upper limit on background conditions, which could occur occasionally due to natural variation, it is customary to confirm any parameter concentrations greater than the BV with a subsequent sample (the probability of two subsequent samples exceeding the BV at random is very low).

In performing the statistical procedures required, any non-detect (less-than) data were substituted with a value of one-half the reported detection limit prior to testing, with the

exception of non-parametric UTL calculations (see Section 3.2) where no prior substitution was needed.

2.2.1 ASSESSMENT OF DATA CHARACTERISTICS AND ASSUMPTIONS

Before calculating BVs, statistical characterization of the upgradient data sets was necessary to determine the appropriate methods to use. Specifically, assumptions regarding data distribution and the presence of statistical outliers were evaluated, and the presence of censored data (non-detects) quantified.

Each analyte's data set was evaluated to determine if it was normally-distributed, gamma distributed, lognormally-distributed, or did not fit any of the distributions tested. Data distribution testing for normality and lognormality was undertaken using the Shapiro-Wilk W-test, and for gamma distribution using the Kolmogorov-Smirnov and Anderson-Darling tests (see USEPA, 2006, 2009b for descriptions of these tests).

The assessment of outliers was performed using Dixon's test or Rosner's test (see USEPA 2006 for details of these tests) applied for the observed data distribution, unless more than half of the data were non-detects (in which case no outlier testing was performed).

The findings of the data distribution and outlier testing were considered in selecting appropriate UTL methods in the BV calculations. Any identified outliers were retained in the BV calculations, since these were found in upgradient conditions, but were considered in assigning an appropriate data distribution (e.g., an apparent outlier in a normal distribution may not be an outlier in a lognormal distribution).

2.2.2 BACKGROUND VALUE (BV) CALCULATION METHODS

Background values were calculated for each analyte on a single-aquifer (Upper Aquifer and Intermediate Aquifer), or on both single-aquifer and combined-aquifer bases (for the Lower Aquifer, having fewer background samples).

Depending on the findings of the initial data characterization (Section 3.1 above), an appropriate UTL method was selected for BV calculation as indicated in the following table:

<i>Data Distribution</i>	<i>Appropriate UTL for Background Value calculation</i>		
	<i>0-50% Non-detects</i>	<i>51-99% Non-detects</i>	<i>100% Non-detects</i>
Normal	Student's <i>t</i> -UTL	Non-parametric UTL	Maximum DL
Gamma	Gamma UTL	Non-parametric UTL	Maximum DL
Lognormal	Student's <i>t</i> -UTL (log)	Non-parametric UTL	Maximum DL
Not identifiable	Non-parametric UTL	Non-parametric UTL	Maximum DL

Note: DL – detection limit reported for non-detect results

As noted above, descriptions of the methods for calculating these various UTLs are available in USEPA (2009a; 2009b; 2006; 1989), Hahn and Meeker (1991), and Guenther (1972). In cases where a data set fit more than one distribution (e.g., either gamma or lognormal distribution), the priority for assignment was normal > gamma-distributed > lognormal, consistent with USEPA (2009b).

It is noted that when the use of non-parametric UTLs was required (i.e., if a data set did not follow an identified distribution or had greater than 50 percent non-detects), the desired percentile (95th) of background is not achieved using the existing data. This is due to the number of background samples available, since the non-parametric UTL method requires 86 or more data points to achieve a 95th percentile estimate with 95 percent confidence. In these cases, the BV calculated will be conservatively low, but is the best estimate available with the current data set.

Single Upper Aquifer and Intermediate Aquifer background values were used for the current evaluation since there are enough data samples (8 to 10) in the background wells WT102A and WT102B to calculate the BV. Due to the low numbers of background data for the Lower Aquifer (4-7 points, depending on the monitoring parameter), a combined-background data set consisting of results from all three zones (i.e., wells WT102A in the Upper Aquifer, WT102B in the Intermediate Aquifer, and WT102C in the Lower Aquifer) was used together with the single aquifer BV for this aquifer.

2.2.3 COMPARISON OF DOWNGRAIENT DATA AGAINST BACKGROUND VALUES

Samples collected on Site in 2009 and 2010 were subjected to a point-by-point comparison against the calculated BVs. This was done both on a per-aquifer (Upper Aquifer, Intermediate Aquifer and Lower) and on a combined-aquifer basis. If an observed analyte concentration in a downgradient well sample was found to be greater than the calculated BV, then it was concluded to be elevated above background conditions.

2.3 BV CALCULATION RESULTS

The upgradient data sets used to calculate BVs are shown in Table 1. The calculated BVs are provided in Table 2 (Upper Aquifer), Table 3 (Intermediate Aquifer), Table 4 (Lower Aquifer) and Table 5 (Combined Aquifers). Summary statistics and data distributions are also provided for each analyte on these Tables. The BVs provided are suitable for ongoing point-by-point comparisons of downgradient vs. upgradient conditions. They are not appropriate for group-based tests, such as mean or median comparisons, for which other statistical procedures should be applied.

The results of point-by-point comparisons of downgradient data vs. BVs are shown in Table 6 (Upper Aquifer), Table 7 (Intermediate Aquifer) and Table 8 (Lower Aquifer). Recent data (2009 and 2010) are highlighted in boldface and surrounded by a boxed border when they exceed a BV, and for the Lower Aquifer wells are highlighted in boldface surrounded by a double-boxed border when they exceed both the Lower Aquifer and Combined Aquifer BVs.

In samples from the Upper Aquifer downgradient wells, 82 of a total 1269 observations (6.5 percent) were found to be greater than their respective BVs. This number is consistent with the frequency of observations that could be expected, since the BVs represent 95th percentile values of background. Nonetheless, in cases where all 2009-2010 data are greater than a BV for a given downgradient well, this should be considered as evidence that the observed analyte concentrations are inconsistent with background conditions. The analytes most frequently found at concentrations greater than the Upper Aquifer-aquifer BVs were barium (in 5 of 12 Site wells), aluminum and potassium (in 4 wells each). Samples from downgradient well WT116A appeared to be the most impacted, with 10 of 27 analytes detected at concentrations greater than the BVs at this location. Samples from well WT115A contained 7 analytes at concentrations greater than the BVs and wells WT101A and WT106A each had five analytes detected at

sample concentrations greater than the BVs. Other analytes and wells had only sporadic occurrence of concentrations exceeding BVs.

In the Intermediate Aquifer wells, a somewhat higher frequency, 71 of a total 972 total observations (7.3 percent) of concentrations exceeding BVs was observed compared to the Upper Aquifer wells. In all but a few cases, the given analyte concentration exceeded its BV in all (or all but one) of the 2009-2010 samples at a Site well, which is considered to be evidence that analyte concentrations are inconsistent with background conditions. Calcium and iron were the analytes most frequently found at concentrations greater than the Intermediate Aquifer-aquifer BVs (each in 6 of 9 Site wells), followed by sodium, which was detected at concentrations greater than background in samples from three Site wells. Samples from well WT112B contained five analytes found at concentrations greater than their BVs, and samples from well WT101B contained four analytes found at concentrations greater than their BVs. Samples from wells WT114B, WT116B, WT117B, and WTE1 each had three analytes detected at concentrations greater than the BVs. Other analytes and wells had only sporadic occurrence of sample concentrations exceeding BVs.

Infrequent occurrence (12 of 432, or 2.3 percent) of analyte concentrations exceeding the Lower-Aquifer and combined-aquifer BVs was observed in samples from the Lower Aquifer wells. Arsenic was the only parameter detected more than once in the 2009-2010 samples at concentrations greater than the BVs, and all of the samples were collected from well WT101C. Aside from this, the Lower Aquifer well data exhibited no particular pattern other than occasional exceedance of a BV. Interestingly, magnesium was detected in the November 2009 sample from the Lower Aquifer background well (WT102C) at a concentration greater than the calculated Combined-Aquifer BV. Insufficient data exist to create a Lower Aquifer BV based entirely on WT102C data (as noted above, the current number of background samples for the Lower Aquifer is below the recommended 8-10 minimum).

3.0 ASSESSMENT OF CONCENTRATION TRENDS OVER TIME (2008-2010)

3.1 STATISTICAL TREND TEST PROCEDURES

Methods for statistical trend testing are discussed in Section 17.3 of USEPA (2009a), Section 4.3 of USEPA (2006), Chapter 12 of USGS (2002) and other relevant guidance and reference texts. The evaluation of trends in environmental data is often complicated by factors such as seasonality in data, outlying (grossly atypical) data points, the presence of censored (non detect) data, small data sets (due to the relatively high costs associated with sample collection and analysis, particularly for trace concentration analyses) and non linearity in any patterns present through time. Different tests exist, which balance the statistical power of detecting trends against susceptibility to outliers, deviations from model assumptions (e.g., linearity) and the ability to incorporate non detect data into the analyses.

One trend test suitable for general application across a variety of environmental data applications is the Mann-Kendall test. This test is non parametric (rank based), and therefore robust with respect to individual outlying observations. The Mann-Kendall test neither assumes a particular data distribution (e.g., normal) nor data pattern tested (e.g., linear trend), but rather tests for a monotonic (single direction) trend in the data over time. Although the test is not as powerful as parametric tests are under optimal conditions, its wide range of applicability makes it a good candidate for use when testing numerous data sets where the effort required for detailed characterization and selection of specific trend tests on a case-by-case basis is not appropriate.

The Mann-Kendall trend test was therefore selected for use in the assessing the quarterly groundwater data obtained between 2008-2010 for the presence of temporal trends. Computational details for the test may be found in Section 4.3.4.1 of USEPA (2006).

3.2 SCOPE OF DATA

Quarterly groundwater sampling has been undertaken at Site monitoring wells beginning in October-November 2008. Since that time, a total of six quarterly monitoring events have occurred through February-March 2010. Six samples is near the lower range with which trend testing using the Mann-Kendall test may be carried out. As such, the current trend analyses provide an initial assessment of temporal trends, but may lack sufficient statistical power to detect more subtle temporal trends. The acquisition of additional data from ongoing monitoring will improve the power of the Mann-Kendall test in future evaluations.

The wells included in the trend analyses include the following:

Upper Aquifer Wells

WT101A	WT106A	WT114A
WT102A	WT111A	WT115A
WT103A	WT112A	WT116A
WT104A	WT113A	WT117A
WT105A		

Intermediate Aquifer Wells

WT101B	WT114B	WT118B
WT102B	WT116B	WTB3
WT112B	WT117B	WTE1
WT113B		

Lower Aquifer Wells

WT101C	WTB1	WTE3
WT102C	WTB4	

Temporal trends were evaluated for a select list of analytes, including the following:

Organic Compounds

Benzene	cis-1,2-Dichloroethene
Carbon disulphide	bis(2-Ethylhexyl)phthalate (DEHP)
1,1-Dichloroethane	Vinyl chloride

Inorganics

Calcium	Manganese
Iron	Sulfate

The Mann-Kendall trend test is based on ranking individual observations relative to one another (e.g., a concentration of 5 µg/L is higher than a concentration of 3 µg/L). In some cases, detected analyte concentrations were estimated at values below the reported detection limits for non-detect results in other sampling events. When this occurred, the ranking of relative analyte concentrations is ambiguous (e.g., although a concentration

of 1.8 µg/L is higher than a non-detect at 1U µg/L, an estimated detected value of 0.59J µg/L may not be meaningfully ranked as higher or lower than the non-detect). When this situation occurred, the non-detect data were excluded from the trend analysis, as long as doing so resulted in sufficient detected values remaining (four or more) to perform the Mann-Kendall test. This is evident on the results tables (see next Section) when one analyte has a lower number of samples reported than others at the same well. In cases where only four observations remained, the Mann-Kendall test was applied using a 90 percent confidence level, since 95 percent confidence may not be achieved with fewer than five data points.

3.3 TREND TEST RESULTS

The results of the Mann-Kendall trend analyses are shown in Table 9 (Upper Aquifer), Table 10 (Intermediate Aquifer) and Table 11 (Lower Aquifer). Of the 280 data sets considered, 98 consisted entirely of non-detect results, 35 had more than 50 percent non-detects, 10 had fewer than four observations remaining, and three had fewer than four observations remaining after the removal of data with detection limits greater than other detected values (see previous Section). The remaining 134 data sets were subjected to trend analysis using the Mann-Kendall test.

The trend tests found 127 of the 134 data sets tested did not exhibit any statistically significant (above 95 percent confidence, or above 90 percent confidence for data sets with four observations) trend in analyte concentrations over time during the 2008-2010 period. Six data sets had statistically significant decreasing trends and one data set had a statistically significant increasing trend. The statistically significant trends identified include:

Decreasing Trends

- Sulfate in samples from WT101B (Intermediate Aquifer)
- Sulfate in samples from WT102B (Intermediate Aquifer)
- Vinyl chloride in samples from WT117B (Intermediate Aquifer)
- Iron in samples from WTB3 (Intermediate Aquifer)
- Sulfate in samples from WTE1 (Intermediate Aquifer)
- Sulfate in samples from WT102C (Lower Aquifer)

Increasing Trends

- Manganese in samples from WTB1 (Lower Aquifer)

No trends in concentrations over time were observed in Upper Aquifer wells. In the Intermediate Aquifer, decreases in sulfate (3 wells), iron and vinyl chloride (1 well each) concentrations over time were observed. In the Lower Aquifer, one decreasing trend (for sulfate) and one increasing trend (for manganese) were detected.

4.0 CONCLUSIONS

As described above in Section 2, CRA has established BVs for the 23 inorganic analytes and four general chemistry parameters in each of the monitored aquifers (Upper, Intermediate and Lower) at the Site. These BVs are presented in Tables 2 through 5, and are appropriate for point-by-point comparisons to on-Site data.

The comparison of recent (2009-2010) downgradient data against upgradient BVs (Tables 6-8) indicates that in the vast majority of cases, concentrations of inorganics in downgradient wells are consistent with background conditions. However, there are certain wells where sample concentrations of specific analytes were consistently greater than background concentrations over the 2009-2010 period. These include the following:

- Iron, manganese, and potassium at WT101A (Upper Aquifer)
- Barium at WT111A (Upper Aquifer)
- Barium and sodium at WT114A (Upper Aquifer)
- Antimony, barium, lead, and potassium at WT115A (Upper Aquifer)
- Calcium, magnesium, potassium, sodium, and zinc at WT116A (Upper Aquifer)
- Aluminum at WT117A (Upper Aquifer)
- Calcium, magnesium, and potassium at WT101B (Intermediate Aquifer)
- Barium, calcium, and magnesium at WT112B (Intermediate Aquifer)
- Arsenic and iron at WT114B (Intermediate Aquifer)
- Barium, calcium, and iron at WT116B (Intermediate Aquifer)
- Calcium and iron at WT117B (Intermediate Aquifer)
- Calcium and iron at WT118B (Intermediate Aquifer)
- Manganese at WTB3 (Intermediate Aquifer)
- Calcium at WTE1 (Intermediate Aquifer)
- Arsenic at WT101C (Lower Aquifer)

In general, the greatest proportional occurrence of analyte concentrations consistently greater than BVs has been observed in Intermediate Aquifer wells, followed by Upper Aquifer wells, with only one case in a Lower Aquifer well.

The temporal trend tests (analyte concentrations over time during the 2008-2010 period), reported in Section 3, above, found very few statistically significant trends (i.e., one increasing and six decreasing trends out of 280 total data sets). The numbers of

quarterly samples available for the trend analyses, typically six depending on the well, are on the lower end of the number of samples required for carrying out trend tests. Although the trend tests are valid, this reduces the statistical power of detecting all but the strongest trends (i.e., those with data consistently increasing or consistently decreasing across almost every quarterly observation). With the collection of additional future monitoring data, the power of the trend tests to detect more gradual shifts in concentrations over time will be improved.

The statistically-significant trends in analyte concentrations over time that were detected include the following:

- Decreasing sulfate in WT101B (Intermediate Aquifer)
- Decreasing sulfate in WT102B (Intermediate Aquifer)
- Decreasing vinyl chloride in WT117B (Intermediate Aquifer)
- Decreasing iron in WTB3 (Intermediate Aquifer)
- Decreasing sulfate in WTE1 (Intermediate Aquifer)
- Decreasing sulfate in WT102C (Lower Aquifer)
- Increasing manganese in WTB1 (Lower Aquifer)

The findings of these statistical tests should be considered in the overall evaluation of the success of Site remediation/risk management activities.

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TABLE E.1
BACKGROUND DATA FROM UPGRADIENT WELLS
HIMCO SITE
ELKHART, INDIANA

		Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Intermediate	Intermediate	Intermediate	Intermediate
Well Type:		Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer
Sample Location:		WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102A	WT102B	WT102B	WT102B	WT102B
Sample Depth:		8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	8.4-18.4	62.9-67.9	62.9-67.9	62.9-67.9	62.9-67.9
		ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs
Sample Date:		1990/11	1991/01	1991/09	1995/09	1998/10	2000/04	2008/10	2009/02	2009/04	2009/08	2009/11	2010/02	1991/01	1991/09	1995/09	2000/04
Parameter	Units																
Metals																	
Aluminum	µg/L	32.7 BJ	81.8 B	165 BJ	268/200 U	27.6 J	118 U	92.2	106/109	262	22.1 J	262	554	25.0 U	139 BJ	200 U/161 J	118 U
Antimony	µg/L	30.0 U	37.0 U	13.00 U	21.7 J/60 U	42.2 UJ	2 U	2.0 U	2.0 U/2.0 U	2.0 U	2.0 U	0.15 J	2.0 U	37.0 U	13.0 U	60 U/29.7 J	2 U
Arsenic	µg/L	-	-	-	3.8 U/10 U	0.90 UJ	2 U	0.46 J	0.54 J/0.50 J	0.71 J	0.78 J	0.55 J	0.79 J	3.0 U	2.0 UJ	10 U/4.8 J	6 J
Barium	µg/L	65.5 B	60.3 B	56.5 B	53.3 J/200 U	47.3 J	46.7	42.5 J	40.0 J/37.6 J	32.6 J	34.0 J	41.0 J	42.3 J	103 B	85.1 B	200 U/91.0 J	103
Beryllium	µg/L	1.20 B	3.1 BJ	1.00 U	1.3 J/5 U	0.60 UJ	2 U	1.0 U	1.0 U/1.0 U	1.0 U	1.0 U	0.48 J	1.0 U	-	-	5 U/0.40 U	2 U
Cadmium	µg/L	-	-	-	1.1 U/5 U	4.6 UJ	0.1 U	1.0 U	1.0 U/1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 U/1.1 U	0.1 U
Calcium	µg/L	211000	181000	165000	157000/170000	17100 J	173000	99800/99800	102000/95100	73200	89500	93600	89000	68700	62400	67100/61200	75800
Chromium (Total)	µg/L	5.0 U	6.5 BJ	2.80 B	23.9/10 U	20.3 J	17.8 J	47.1	6.8 J/6.4 J	31.3	7.2 J	128	427	4.0 U	2.0 U	10 U/4.0 U	24.2 J
Cobalt	µg/L	7.0 U	5.0 U	3.00 U	13.1 J/50 U	7.8 UJ	4.1 J	50.0 U	50.0 U/50.0 U	1.9 J	50.0 U	2.7 J	50.0 U	5.0 U	3.0 U	50 U/12.4 J	13.2 U
Copper	µg/L	6.9 BJ	16.7 BJ	6.00 U	17.9 J/25 U	4.1 UJ	9.3 U	25.0 U	37.5/63.7	25.0 U	25.0 U	25.0 U	7.5 J	4.9 BJ	6.0 U	25 U/1.7 U	9.3 U
Iron	µg/L	56.5 BJ	123	60.80 B	39.0 J/100 U	96.8 J	115 JB	480	155/178	855	107	1040	2760	15.0 U	70.6 B	493/490	1580 JB
Lead	µg/L	2.2 BJ	1.0 UJ	1.00 U	1.7 U/3 U	0.50 UJ	2 U	3.0 U	3.0 U/3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	1.2 BJ	1.0 UJ	3 U/1.7 U	2 U
Magnesium	µg/L	25100	22500	20300	15900/16200	16600 J	18800 J	17800	17800/19100	14000	15900	17000	16800	21300	19400	21900/20400	22300
Manganese	µg/L	38.1	23	9.20 B	30.2/21	61.5 J	86.7	62.2	62.5/59.4	195	110	112	641	124	118	79/87.3	91.9
Mercury	µg/L	-	-	-	0.20 U/0.2 U	0.10 J	0.1 U	0.20 U	0.20 U/0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-	0.2 U/0.20 U	0.1 U
Nickel	µg/L	6.0 U	20.0 U	7.00 U	40.6/40 U	73.0 J	45.4 J	18.0 J	38.5 J/35.4 J	21.9 J	44.3	129	86.6	20.0 U	7.0 U	40 U/9.5 U	8.1 J
Potassium	µg/L	2110.0 B	2000 B	2120 B	2070 J/5000 U	1610 J	2060	1320 J	1090 J/1160 J	1090 J	943 J	1530 J	1320 J	1420 B	1690 B	5000 U/1870 J	1840
Selenium	µg/L	-	-	-	3.6 U/5 U	6.0 UJ	2 U	5.0 U	5.0 U/5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-	5 U/3.6 U	2 U
Silver	µg/L	5.0 U	5.0 UJ	2.00 UJ	19.5/10 U	6.1 J	11.1 U	10.0 U	10.0 U/10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	5.0 UJ	2.0 UJ	10 U/2.5 U	3.4 J
Sodium	µg/L	48600	41900	50700 J	52300 J/50000	48000 J	100000	58500	62300/58300	61200	55300	70400	71400	26100	26900 J	27700/27800 J	25900
Thallium	µg/L	-	-	-	4.7/20	0.40 UJ	1 U	1.0 U	1.0 U/1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	3.0 U	14/5.7 J	1 U
Vanadium	µg/L	3.0 U	4.0 U	2.00 U	26.5 J/50 U	12.3 UJ	5.1 U	0.65 J	50.0 U/50.0 U	50.0 U	50.0 U	0.69 J	3.3 J	4.0 U	2.0 U	50 U/13.2 J	1.9 J
Zinc	µg/L	9.0 U	24.1 J	6.00 U	4.1 J/20 U	3.2 UJ	34.1 U	20.0 U	20.0 U/20.0 U	20.0 U	7.3 J	20.0 U	20.0 U	12.1 BJ	6.0 U	20 U/3.5 J	34.1 U
General Chemistry																	
Bromide	µg/L	100 U	100	100 U	-	-	60 J	500 U	500 U/500 U	500 U	500 U	500 U	500 U	200	100 U	-	80 J
Chloride	µg/L	-	-	-	-	-	-	114000	164000/162000	108000	142000	168000	182000	-	-	-	-
Cyanide (total)	µg/L	R	10.0 U	10.00 U	10.0 U/10 U	8.5 J	-	-	10 U/10 U	10 U	10 U	10 U	10 U	-	-	10 U/10.0 U	-
Sulfate	µg/L	430000	360000 J	338000 J	-	-	202000 JD	87100	44200/44800	29700	56300	73000	61500	64000 J	430000	-	58000 JD

Notes:
- No data/not analyzed
U - Analyte not detected above specified detection limit
UJ - Estimated reporting limit
J - Analyte was estimated
B - Method blank contamination
D - Compounds at secondary dilution factor
R - Rejected data
268/200 U - Field duplicate result

TABLE E.1
BACKGROUND DATA FROM UPGRADIENT WELLS
HIMCO SITE
ELKHART, INDIANA

		Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Lower	Lower	Lower	Lower	Lower	Lower	Lower
		Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer	Aquifer
		WT102B	WT102B	WT102B	WT102B	WT102B	WT102B	WT102C	WT102C	WT102C	WT102C	WT102C	WT102C	WT102C
		62.9-67.9	62.9-67.9	62.9-67.9	62.9-67.9	62.9-67.9	62.9-67.9	157-162	157-162	157-162	157-162	157-162	157-162	157-162
		ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs	ft bgs
		2008/10	2009/02	2009/04	2009/08	2009/11	2010/02	1991/01	1991/09	2008/10	2009/04	2009/08	2009/11	2010/02
Well Type:														
Sample Location:														
Sample Depth:														
Sample Date:														
Parameter	Units													
Metals														
Aluminum	µg/L	20.1 J	50.0 U	50.0 U / 50.0 U	50.0 U	23.2 J	50.0 U	1130	171 BJ	1750	185	489	2010	790
Antimony	µg/L	2.0 U	2.0 U	0.26 J / 2.0 U	0.44 J	2.0 U	0.17 J	-	-	0.15 J	2.0 U	0.18 J	0.48 J	0.48 J
Arsenic	µg/L	4.6	4.1	3.9 / 3.9	2.4	3.0	2.8	3.0 U	2.0 UJ	2.6	2.3	2.1	3.1	3.4
Barium	µg/L	92.3 J	84.2 J	101 J / 97.7 J	107 J	101 J	124 J	100 B	63 B	141 J	166 J	177 J	203	224
Beryllium	µg/L	1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U	0.47 J	1.0 U	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U	0.57 J	1.0 U
Cadmium	µg/L	1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	µg/L	49700	51800	57300 / 53100	45900	57000	62800	71400	50700	52100	65700	59500	97400	74600
Chromium (Total)	µg/L	4.1 J	3.3 J	10.0 U / 2.5 J	20.2	6.9 J	8.4 J	23.8 J	2.0 U	10.8	10.0 U	8.0 J	8.3 J	5.1 J
Cobalt	µg/L	50.0 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U	7.3 B	3.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
Copper	µg/L	25.0 U	25.0 U	25.0 U / 25.0 U	25.0 U	25.0 U	25.0 U	8.8 BJ	6.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U
Iron	µg/L	529	601	564 / 541	857	676	677	1680	89 B	1170	418	1130	3330	1620
Lead	µg/L	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U	3.0 U	1.8 BJ	1.0 UJ	2.3 J	3.0 U	3.0 U	1.9 J	3.0 U
Magnesium	µg/L	19800	19400	21400 / 21000	22600	21400	23600	24800	16200	32300	27500	28900	45800	31800
Manganese	µg/L	47.2	113	57.5 / 52.0	37.7	51.9	50.4	231	170	86	168	164	379	331
Mercury	µg/L	0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	40.0 U	40.0 U	40.0 U / 40.0 U	7.5 J	3.2 J	3.5 J	20.0 U	7.0 U	8.9 J	40.0 U	5.7 J	6.4 J	4.3 J
Potassium	µg/L	4530 J	4320 J	3610 J / 4780 J	6240 J	2920 J	2750 J	1290 B	902 B	2150 J	1120 J	1700 J	2230 J	1420 J
Selenium	µg/L	5.0 U	5.0 U	5.0 U / 4.4 J	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	10.0 U	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U	10.0 U	-	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	µg/L	25500	25000	25000 / 26100	30000	24100	25600	3180 B	7230 J	42600	8640	35400	23500	11000
Thallium	µg/L	0.15 J	1.0 U	1.0 U / 1.0 U	0.21 J	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	µg/L	50.0 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U	7.5 B	2.0 U	2.8 J	50.0 U	1.4 J	4.5 J	1.6 J
Zinc	µg/L	20.0 U	20.0 U	20.0 U / 20.0 U	7.9 J	5.5 J	20.0 U	24.7 J	6.0 U	18.8 J	20.0 U	9.7 J	20.9	20.0 U
General Chemistry														
Bromide	µg/L	500 U	500 U	500 U / 500 U	500 U	500 U	500 U	100	110	500 U	500 U	500 U	500 U	300 J
Chloride	µg/L	43700	43500	46700	49200	46700	48300	-	-	52300	61500	56300	53600	58200
Cyanide (total)	µg/L	-	10 U	10 U / 10 U	7 J	10 U	10 U	-	-	-	10 U	10 U	10 U	10 U
Sulfate	µg/L	52700	47300	44900 / 1000 U	45600	40800	35300	35000 J	50000 J	47100	38300	32900	22800	31200

Notes:

- No data/not analyzed
- U - Analyte not detected above specified detection limit
- UJ - Estimated reporting limit
- J - Analyte was estimated
- B - Method blank contamination
- D - Compounds at secondary dilution factor
- R - Rejected data
- 268/200 U - Field duplicate result

TABLE E.2

**BACKGROUND VALUE CALCULATIONS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Units</i>	<i>Number of Samples</i>	<i>Percent Non-Detect</i>	<i>Minimum</i>	<i>Maximum</i>	<i>95/95 UTL ¹ Method</i>	<i>Background Value</i>
Upper Aquifer Background (Upgradient) Well: WT102A							
Aluminum	µg/L	12	8%	22.1 J	554	Parametric-gamma	860
Antimony	µg/L	12	83%	0.15 J	42.2 UJ	Non-parametric	42.2 UJ
Arsenic	µg/L	9	33%	0.46 J	6.9 U	Non-Parametric	6.9 U
Barium	µg/L	12	0%	32.6 J	65.5 B	Parametric	75
Beryllium	µg/L	12	67%	0.48 J	3.1 BJ	Non-parametric	3.1 BJ
Cadmium	µg/L	9	100%	0.1 U	4.6 UJ	Max DL	4.6 UJ
Calcium	µg/L	12	0%	17100 J	211000	Parametric	275000
Chromium (Total)	µg/L	12	8%	2.80 B	427	Parametric-log	1180
Cobalt	µg/L	12	67%	1.9 J	50.0 U	Non-parametric	50 U
Copper	µg/L	12	58%	4.1 UJ	50.6	Non-parametric	50.6
Iron	µg/L	12	0%	39	2760	Parametric-log	7720
Lead	µg/L	12	92%	0.50 UJ	3.0 U	Non-parametric	3.0 U
Magnesium	µg/L	12	0%	14000	25100	Parametric	26700
Manganese	µg/L	12	0%	9.20 B	641	Parametric-gamma	712
Mercury	µg/L	9	89%	0.10 J	0.2 U	Non-parametric	0.2 U
Nickel	µg/L	12	25%	6.0 U	129	Parametric	146
Potassium	µg/L	12	0%	943 J	2120 B	Parametric	2830
Selenium	µg/L	9	100%	2 U	6.0 UJ	Max DL	6.0 UJ
Silver	µg/L	12	83%	2.00 UJ	19.5	Non-parametric	19.5
Sodium	µg/L	12	0%	41900	100000	Parametric-gamma	106000
Thallium	µg/L	9	89%	0.40 UJ	12.35	Non-parametric	12.35
Vanadium	µg/L	12	67%	0.65 J	50 U	Non-parametric	50 U
Zinc	µg/L	12	75%	3.2 UJ	34.1 U	Non-parametric	34.1 U
Bromide	µg/L	10	80%	60 J	500 U	Non-parametric	500 U
Chloride	µg/L	6	0%	108000	182000	Parametric	258000
Cyanide (total)	µg/L	9	89%	8.5 J	10.0 U	Non-parametric	10 U
Sulfate	µg/L	10	0%	29700	430000	Parametric-gamma	965000

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

Max DL - Maximum Detection Limit.

¹ Upper Tolerance Limits (UTLs) on the 95th percentile of the upgradient data, with 95 percent confidence. UTLs are calculated using a method appropriate for the observed data distribution.

TABLE E.3

**BACKGROUND VALUE CALCULATIONS -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Units</i>	<i>Number of Samples</i>	<i>Percent Non-Detect</i>	<i>Minimum</i>	<i>Maximum</i>	<i>95/95 UTL ¹ Method</i>	<i>Background Value</i>
<i>Intermediate Aquifer Background (Upgradient) Well: WT102B</i>							
Aluminum	µg/L	10	60%	20.1 J	161	Non-parametric	161
Antimony	µg/L	10	60%	0.17 J	37.0 U	Non-parametric	37 U
Arsenic	µg/L	10	20%	2.0 UJ	6 J	Parametric	7.9
Barium	µg/L	10	0%	84.2 J	124 J	Parametric	133
Beryllium	µg/L	8	88%	0.47 J	2.7 U	Non-parametric	2.7 U
Cadmium	µg/L	8	100%	0.1 U	3.05 U	Max DL	3.05 U
Calcium	µg/L	10	0%	45900	75800	Parametric	86000
Chromium (Total)	µg/L	10	30%	2.0 U	24.2 J	Parametric-log	89
Cobalt	µg/L	10	90%	3.0 U	50.0 U	Non-parametric	50 U
Copper	µg/L	10	90%	4.9 BJ	25.0 U	Non-parametric	25 U
Iron	µg/L	10	10%	15.0 U	1580 JB	Parametric	1870
Lead	µg/L	10	90%	1.0 UJ	3.0 U	Non-parametric	3.0 U
Magnesium	µg/L	10	0%	19400	23600	Parametric	25300
Manganese	µg/L	10	0%	37.7	124	Parametric	173
Mercury	µg/L	8	100%	0.1 U	0.20 U	Max DL	0.20 U
Nickel	µg/L	10	60%	3.2 J	40.0 U	Non-parametric	40 U
Potassium	µg/L	10	0%	1420 B	6240 J	Parametric	7790
Selenium	µg/L	8	88%	2 U	5.0 U	Non-parametric	5.0 U
Silver	µg/L	10	90%	2.0 UJ	10.0 U	Non-parametric	10 U
Sodium	µg/L	10	0%	24100	30000	Parametric	31100
Thallium	µg/L	10	70%	0.15 J	9.85	Non-parametric	9.85
Vanadium	µg/L	10	80%	1.9 J	50.0 U	Non-parametric	50.0 U
Zinc	µg/L	10	60%	3.5	34.1 U	Non-parametric	34.1 U
Bromide	µg/L	9	78%	80 J	500 U	Non-parametric	500 U
Chloride	µg/L	6	0%	43500	49200	Parametric	55000
Cyanide (total)	µg/L	6	83%	7 J	10 U	Non-parametric	10 U
Sulfate	µg/L	9	0%	35300	430000	Non-Parametric	430000

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

Max DL - Maximum Detection Limit.

⁽¹⁾ Upper Tolerance Limits (UTLs) on the 95th percentile of the upgradient data, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

TABLE E.4

**BACKGROUND VALUE CALCULATIONS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Units</i>	<i>Number of Samples</i>	<i>Percent Non-Detect</i>	<i>Minimum</i>	<i>Maximum</i>	<i>95/95 UTL ¹ Method</i>	<i>Background Value</i>
<i>Lower Aquifer Background (Upgradient) Well: WT102C</i>							
Aluminum	µg/L	7	0%	171 BJ	2010	Parametric	3420
Antimony	µg/L	5	20%	0.15 J	2.0 U	Parametric	1.89
Arsenic	µg/L	7	29%	2.0 UJ	3.4	Parametric	5.17
Barium	µg/L	7	0%	63 B	224	Parametric	346
Beryllium	µg/L	7	71%	0.57 J	4.5 BJ	Non-parametric	4.5 BJ
Cadmium	µg/L	5	100%	1.0 U	1.0 U	Max DL	1.0 U
Calcium	µg/L	7	0%	50700	97400	Parametric	122000
Chromium (Total)	µg/L	7	29%	2.0 U	23.8 J	Parametric	33.6
Cobalt	µg/L	7	86%	3.0 U	50.0 U	Non-parametric	50 U
Copper	µg/L	7	86%	6.0 U	25.0 U	Non-parametric	25 U
Iron	µg/L	7	0%	89 B	3330	Parametric	4930
Lead	µg/L	7	57%	1.0 UJ	3.0 U	Non-parametric	3.0 U
Magnesium	µg/L	7	0%	16200	45800	Parametric	60100
Manganese	µg/L	7	0%	86	379	Parametric	570
Mercury	µg/L	5	100%	0.20 U	0.20 U	Max DL	0.20 U
Nickel	µg/L	7	43%	4.3 J	40.0 U	Parametric	28
Potassium	µg/L	7	0%	902 B	2230 J	Parametric	3260
Selenium	µg/L	5	100%	5.0 U	5.0 U	Max DL	5.0 U
Silver	µg/L	5	100%	10.0 U	10.0 U	Max DL	10.0 U
Sodium	µg/L	7	0%	3180 B	42600	Parametric	70800
Thallium	µg/L	5	100%	1.0 U	1.0 U	Max DL	1.0 U
Vanadium	µg/L	7	29%	1.4 J	50.0 U	Parametric-gamma	59
Zinc	µg/L	7	43%	6.0 U	24.7 J	Parametric	40
Bromide	µg/L	7	57%	100	500 U	Non-parametric	500 U
Chloride	µg/L	5	0%	52300	61500	Parametric	71800
Cyanide (total)	µg/L	4	100%	10 U	10 U	Max DL	10 U
Sulfate	µg/L	7	0%	22800	50000 J	Parametric	68700

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

Max DL - Maximum Detection Limit.

Upper Tolerance Limits (UTLs) on the 95th percentile of the upgradient data, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

TABLE E.5

**BACKGROUND VALUE CALCULATIONS -- COMBINED AQUIFERS
HIMCO SITE
ELKHART, INDIANA**

<i>Analyte</i>	<i>Units</i>	<i>Number of Samples</i>	<i>Percent Non-Detect</i>	<i>Minimum</i>	<i>Maximum</i>	<i>95/95 UTL ¹ Method</i>	<i>Background Value</i>
<i>Background (Upgradient) Wells (All aquifers): WT102A, WT102B, WT102C</i>							
Aluminum	µg/L	29	24%	20.1 J	2010	Parametric-log	2850
Antimony	µg/L	27	63%	0.15 J	42.2 UJ	Non-parametric	42.2 UJ
Arsenic	µg/L	26	27%	0.46 J	6.9 U	Parametric-gamma	8
Barium	µg/L	29	0%	32.6 J	224	Parametric-gamma	231
Beryllium	µg/L	27	74%	0.47 J	4.5 BJ	Non-parametric	4.5 BJ
Cadmium	µg/L	22	100%	0.1 U	4.6 UJ	Max DL	4.6 UJ
Calcium	µg/L	29	0%	17100 J	211000	Non-Parametric	211000
Chromium (Total)	µg/L	29	21%	2.0 U	427	Parametric-log	183
Cobalt	µg/L	29	79%	1.9 J	50.0 U	Non-parametric	50.0 U
Copper	µg/L	29	76%	4.1 UJ	50.6	Non-parametric	51
Iron	µg/L	29	3%	15.0 U	3330	Parametric-gamma	3580
Lead	µg/L	29	83%	0.50 UJ	3.0 U	Non-parametric	3.0 U
Magnesium	µg/L	29	0%	14000	45800	Parametric-log	37700
Manganese	µg/L	29	0%	9.20 B	641	Parametric-gamma	468
Mercury	µg/L	22	95%	0.10 J	0.2 U	Non-parametric	0.2 U
Nickel	µg/L	29	41%	3.2 J	129	Parametric-log	146
Potassium	µg/L	29	0%	902 B	6240 J	Parametric-log	5510
Selenium	µg/L	22	95%	2 U	6.0 UJ	Non-parametric	6.0 UJ
Silver	µg/L	27	89%	2.00 UJ	19.5	Non-parametric	20
Sodium	µg/L	29	0%	3180 B	100000	Parametric	87700
Thallium	µg/L	24	83%	0.15 J	12.35	Non-parametric	12
Vanadium	µg/L	29	62%	0.65 J	50 U	Non-parametric	50 U
Zinc	µg/L	29	62%	3.2 UJ	34.1 U	Non-parametric	34.1 U
Bromide	µg/L	26	73%	60 J	500 U	Non-parametric	500 U
Chloride	µg/L	17	0%	43500	182000	Non-Parametric	182000
Cyanide (total)	µg/L	19	89%	7 J	10.0 U	Non-parametric	10 U
Sulfate	µg/L	26	0%	22800	430000	Non-Parametric	430000

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

Max DL - Maximum Detection Limit.

⁽¹⁾ Upper Tolerance Limits (UTLs) on the 95th percentile of the upgradient data, with 95 percent confidence.

UTLs are calculated using a method appropriated for the data distribution noted.

Combined upgradient wells consist of wells WT102A, WT102B, and WT102C.

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTT101A	16.3	Aluminum	µg/L	860	22.5 J	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	6.8	8.9	6.7	6.6
		Barium	µg/L	75	73.7 J	72.5 J	65.3 J	63.9 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	308000	257000	226000	304000
		Chromium (Total)	µg/L	1180	2.2 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	37200	37300	29000	35800 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	7840	9360	8840	11700
		Manganese	µg/L	712	2630	2420	2010	2700
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.18 J
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	2580 J	3170 J	3200 J	3280 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	110000	11800	20300	20500	19500
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.10 J	0.50 U	0.50 U	0.20 J
		Chloride	µg/L	258000	8.4	23.5	26.3	21.8
		Cyanide (total)	µg/L	10 U	0.010 U	0.0073 J	0.010 U	0.0067 J
		Sulfate	µg/L	965000	419	375	347	434

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations		
					5/2009	8/2009	11/2009 3/2010
WT102A (Background well)	16	Aluminum	µg/L	860	262	22.1 J	262 554
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	0.15 J 2.0 U
		Arsenic	µg/L	6.9 U	0.71 J	0.78 J	0.55 J 0.79 J
		Barium	µg/L	75	32.6 J	34.0 J	41.0 J 42.3 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.48 J 1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U 1.0 U
		Calcium	µg/L	275000	73200	89500	93600 89000
		Chromium (Total)	µg/L	1180	31.3	7.2 J	128 427
		Cobalt	µg/L	50 U	1.9 J	50.0 U	2.7 J 50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U 7.5 J
		Iron	µg/L	7720	855	107	1040 2760
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U 3.0 U
		Magnesium	µg/L	26700	14000	15900	17000 16800
		Manganese	µg/L	712	195	110	112 641
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U 0.20 U
		Nickel	µg/L	146	21.9 J	44.3	129 86.6
		Potassium	µg/L	2830	1090 J	943 J	1530 J 1320 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U 5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U 10.0 U
		Sodium	µg/L	106000	61200	55300	70400 71400
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U 1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	0.69 J 3.3 J
		Zinc	µg/L	34.1 U	20.0 U	7.3 J	20.0 U 20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U 0.50 U
		Chloride	µg/L	258000	108	142	168 182
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U 0.010 U
		Sulfate	µg/L	965000	29.7	56.3	73 61.5

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT103A	16	Aluminum	µg/L	860	122	68.3 U	50.0 U	115
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	2.7	1.5	1.6	1.8
		Barium	µg/L	75	42.4 J	49.9 J	49.1 J	48.0 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	114000	114000	105000	129000
		Chromium (Total)	µg/L	1180	2.4 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1120	810	1380	1760
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	16600	15200	17200	22600
		Manganese	µg/L	712	253	280	229	246
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1220 J	1600 J	2050 J	1370 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	11300	13300	13200	15500
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	0.14 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	21.1	26.3	29.4	29.5 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.023 U	0.0057 J
		Sulfate	µg/L	965000	182	172	231	259

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT104A	16.3	Aluminum	µg/L	860	50.0 U	50.0 U / 50.0 U	58.6	23.6 J
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Barium	µg/L	75	5.7 J	4.6 J / 5.1 J	5.0 J	200 U
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U / 1.0 U	0.55 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	22400	23700 / 24400	18800	21200
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U / 25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	100 U	100 U / 100 U	329	100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	6130	5380 / 5540	4910 J	4960 J
		Manganese	µg/L	712	15.0 U	15.0 U / 15.0 U	3.1 J	15.0 U
		Mercury	µg/L	0.2 U	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U / 40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	5000 U	5000 U / 5000 U	5000 U	550 J
		Selenium	µg/L	6.0 UJ	5.5	5.0 U / 5.0 U	4.9 J	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	3580 J	3330 J / 3550 J	3150 J	2330 J
		Thallium	µg/L	12.35	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	0.66 J / 0.68 J	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U / 5.5 J	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U / 0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	3.4	1.0 / 1.0	0.70 J	0.80 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U / 0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	25.2	7.2 / 7.1	14.8	13.9

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations		
					5/2009	8/2009	11/2009
WT105A	16	Aluminum	µg/L	860	25.4 J	65.0 U	73.6
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	0.52 J	1.0 U	1.0 U
		Barium	µg/L	75	32.3 J	23.1 J	21.3 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.75 J
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	39300	48100	48500
		Chromium (Total)	µg/L	1180	2.8 J	11.1	9.7 J
		Cobalt	µg/L	50 U	50.0 U	2.5 J	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	303	448	332
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	9480	11000	11300
		Manganese	µg/L	712	116	131	65.4
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	14.1 J	15.3 J	19.4 J
		Potassium	µg/L	2830	1070 J	1260 J	1220 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	7640	6700	6170
		Thallium	µg/L	12.35	1.0 U	0.14 J	0.22 J
		Vanadium	µg/L	50 U	50.0 U	0.79 J	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	5.9 J
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 UJ
		Chloride	µg/L	258000	2.8	2.7	3.4
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	19.4	15.6	13.7 J
							2.8
							0.010 U
							14.9

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT106A	16.3	Aluminum	µg/L	860	349	50.0 U	19.1 J	942
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	0.21 J
		Arsenic	µg/L	6.9 U	9	2.1	2.7	38.6
		Barium	µg/L	75	43.2 J	38.9 J	42.2 J	79.3 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	108000	105000	113000	124000
		Chromium (Total)	µg/L	1180	18.7	10.0 U	10.0 U	100
		Cobalt	µg/L	50 U	2.5 J	50.0 U	50.0 U	4.2 J
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	6310	1410	1760	24500
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	12700	13800	13500	14600
		Manganese	µg/L	712	804	488	481	1230
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	3.4 J	40.0 U	40.0 U	9.3 J
		Potassium	µg/L	2830	1650 J	1480 J	1650 J	1760 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	21200	16200	16200	17400
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	0.18 J
		Vanadium	µg/L	50 U	1.9 J	50.0 U	50.0 U	5.3 J
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	34.4	27.9	34.2	43.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	78.5	90.2	109	129

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT111A	20	Aluminum	µg/L	860	1560	384	234	217
		Antimony	µg/L	42.2 UJ	0.18 J	0.22 J	0.20 J	0.18 J
		Arsenic	µg/L	6.9 U	1.9	5.4	5.4	4.6
		Barium	µg/L	75	44.0 J	84.1 J	126 J	86.7 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.51 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	66300	178000	222000	218000
		Chromium (Total)	µg/L	1180	10.0 U	3.3 J	3.1 J	10.0 U
		Cobalt	µg/L	50 U	50.0 U	1.8 J	1.7 J	2.2 J
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1020	3000	3020	3110 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	4930 J	12300	14900	15000
		Manganese	µg/L	712	203	480	581	556
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1860 J	2500 J	4100 J	3670 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	14600	25100	28300	25800 J
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	2.6 J	3.6 J	3.3 J	50.0 U
		Zinc	µg/L	34.1 U	7.0 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.30 J	0.40 J	0.5
		Chloride	µg/L	258000	10.2	14.1	18.9	24.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	102	257	346	368

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTT112A	15.4	Aluminum	µg/L	860	85.1	666	50.0 U	50.0 U / 50.0 U
		Antimony	µg/L	42.2 UJ	2.0 U	0.13 J	2.0 U	2.0 U / 2.0 U
		Arsenic	µg/L	6.9 U	1	5.2	0.66 J	0.77 J / 0.74 J
		Barium	µg/L	75	30.1 J	61.6 J	31.7 J	31.8 J / 32.4 J
		Beryllium	µg/L	3.1 Bj	1.0 U	1.0 U	0.54 J	1.0 U / 1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Calcium	µg/L	275000	233000	297000	213000	311000 / 314000
		Chromium (Total)	µg/L	1180	10.0 U	9.3 J	10.0 U	10.0 U / 10.0 U
		Cobalt	µg/L	50 U	50.0 U	2.2 J	50.0 U	50.0 U / 50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U / 25.0 U
		Iron	µg/L	7720	343	3320	96.4 J	100 U / 100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U
		Magnesium	µg/L	26700	17800	16400	13200	17100 / 16900
		Manganese	µg/L	712	54.5	170	10.7 J	3.3 J / 4.1 J
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U / 0.20 U
		Nickel	µg/L	146	40.0 U	6.8 J	40.0 U	40.0 U / 40.0 U
		Potassium	µg/L	2830	2590 J	2770 J	2760 J	2680 J / 2800 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U / 5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Sodium	µg/L	106000	20400	15200	22100	11300 / 10900
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Vanadium	µg/L	50 U	50.0 U	2.1 J	50.0 U	50.0 U / 50.0 U
		Zinc	µg/L	34.1 U	20.0 U	6.8 J	20.0 U	20.0 U / 20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	2.5 U / 2.5 U
		Chloride	µg/L	258000	41.8	33.2	38.9	31.5 / 30.9
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U / 0.010 U
		Sulfate	µg/L	965000	520	606	445	758 / 762

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTT113A	21.7	Aluminum	µg/L	860	50.0 U	32.3 J	34.1 J	50.0 U
		Antimony	µg/L	42.2 UJ	0.19 J	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	0.82 J	1	0.61 J	0.62 J
		Barium	µg/L	75	15.6 J	14.8 J	14.4 J	16.4 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.53 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	56500	53700	54700	59800
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U	10.0 U	3.9 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	100 U	100 U	100 U	100 U
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	13700	12900	13200	14600
		Manganese	µg/L	712	15.0 U	9.2 J	3.4 J	2.9 J
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	2830	1370 J	1080 J	1290 J	1300 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	24700	18300	16800	21700
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	258000	40.1	32.3	36.7	45.8
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	18.6	17.2	17.3	16.1

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT114A	22	Aluminum	µg/L	860	50.0 U	50.0 U	50.0 U	25.2 J
		Antimony	µg/L	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	6.9 U	1.8	2.2	3	2.8
		Barium	µg/L	75	82.2 J	118 J	99.0 J	83.8 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	109000	137000	104000	101000
		Chromium (Total)	µg/L	1180	10.0 U	10.0 U	10.0 U	5.3 J
		Cobalt	µg/L	50 U	1.9 J	2.0 J	50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	7720	1160	1810	2500	2120
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	26700	20000	25200	18000	18100
		Manganese	µg/L	712	435	774	375	454
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	4.3 J	3.4 J	5.4 J
		Potassium	µg/L	2830	2030 J	2010 J	1780 J	2060 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	210000	271000	244000	231000
		Thallium	µg/L	12.35	1.0 U	1.0 U	0.26 J	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.20 J	0.50 U	2.5 U
		Chloride	µg/L	258000	472	689	423	398
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	39.7	34	409	57

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT115A	17.4	Aluminum	µg/L	860	21000 / 19300	17600	3880 / 4060	10500
		Antimony	µg/L	42.2 UJ	0.74 J / 0.70 J	2.0 U	0.40 J / 0.42 J	0.22 J
		Arsenic	µg/L	6.9 U	2.7 / 2.5	2.6	1.6 / 1.6	1.9
		Barium	µg/L	75	77.8 J / 75.9 J	166 J	115 J / 113 J	126 J
		Beryllium	µg/L	3.1 BJ	1.0 U / 1.0 U	0.63 J	1.0 U / 1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U / 1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Calcium	µg/L	275000	28400 / 28100	253000	355000 / 347000	271000
		Chromium (Total)	µg/L	1180	22.5 / 18.6	17.6	6.0 J / 6.0 J	10.5
		Cobalt	µg/L	50 U	4.3 J / 3.0 J	4.0 J	2.5 J / 2.0 J	2.8 J
		Copper	µg/L	50.6	23.9 J / 16.4 J	13.8 J	25.0 U / 25.0 U	9.0 J
		Iron	µg/L	7720	6830 / 6350	8040	2910 / 4230	5720 J
		Lead	µg/L	3.0 U	9.6 / 9.9	5.5	3.0 U / 3.0 U	4
		Magnesium	µg/L	26700	3450 J / 3330 J	8730	16000 / 15700	9450
		Manganese	µg/L	712	59.7 / 56.0	316	143 / 146	139
		Mercury	µg/L	0.2 U	0.20 U / 0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U
		Nickel	µg/L	146	23.8 J / 19.6 J	17.5 J	6.2 J / 5.0 J	11.6 J
		Potassium	µg/L	2830	1950 J / 1880 J	4000 J	5210 / 5100	4620 J
		Selenium	µg/L	6.0 UJ	5.0 U / 5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U / 10.0 U	10.0 U	10.0 U / 10.0 U	10.0 U
		Sodium	µg/L	106000	4650 J / 4000 J	16900	22500 / 22200	18600
		Thallium	µg/L	12.35	1.0 U / 1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Vanadium	µg/L	50 U	30.4 J / 27.7 J	26.3 J	10.0 J / 10.2 J	17.2 J
		Zinc	µg/L	34.1 U	59.6 U / 57.2 U	43.2	23.0 U / 20.0 U	39.9
		Bromide	µg/L	500 U	0.50 U / 0.50 U	0.30 J	0.40 J / 0.40 J	0.40 J
		Chloride	µg/L	258000	1.6 / 1.6	10.1	13.1	15.7
		Cyanide (total)	µg/L	10 U	0.010 U / 0.010 U	0.010 U	0.0052 J / 0.010 U	0.010 U
		Sulfate	µg/L	965000	10.9 / 11.1	238	314	232

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT116A		Aluminum	µg/L	860	NS	50.0 U	50.0 U	33.5 J
		Antimony	µg/L	42.2 UJ	NS	2.0 U	1.2 J	0.74 J
		Arsenic	µg/L	6.9 U	NS	5.2	2	7.8
		Barium	µg/L	75	NS	93.1 J	58.9 J	94.9 J
		Beryllium	µg/L	3.1 BJ	NS	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	4.6 UJ	NS	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	275000	NS	815000	669000	685000
		Chromium Total	µg/L	1180	NS	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50.0 U	NS	1.8 J	3.3 J	1.7 J
		Copper	µg/L	50.6	NS	38.4	24.4 J	53.5
		Iron	µg/L	7720	NS	3870	361	28700
		Lead	µg/L	3.0 U	NS	2.8 J	3.0 U	5.9
		Magnesium	µg/L	26700	NS	43200	41000	39200
		Manganese	µg/L	712	NS	648	576	646
		Mercury	µg/L	0.2 U	NS	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	146	NS	3.3 J	13.1 J	5.5 J
		Potassium	µg/L	2830	NS	23600	18200	15100
		Selenium	µg/L	6.0 UJ	NS	5.0 U	5.0 U	5.0 U
		Silver	µg/L	19.5	NS	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	106000	NS	164000	148000	125000
		Thallium	µg/L	12.35	NS	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	NS	50.0 U	50.0 U	2.5 J
		Zinc	µg/L	34.1 U	NS	78.5	395	51.7 J
		Bromide	µg/L	500 U	NS	2.8	2.3	1.7
		Chloride	µg/L	258000	NS	14.8	18.1	14.7 J
		Cyanide (total)	µg/L	10.0 U	NS	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	965000	NS	1160	1160	992

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT117A	15.5	Aluminum	µg/L	860	1700	3540	931 / 1000	2170
		Antimony	µg/L	42.2 UJ	2.0 U	0.16 J	0.34 J / 0.35 J	0.19 J
		Arsenic	µg/L	6.9 U	1.0 U	1.0 U	0.40 J / 1.0 U	1.0 U
		Barium	µg/L	75	9.6 J	20.7 J	33.1 J / 31.6 J	26.7 J
		Beryllium	µg/L	3.1 BJ	1.0 U	1.0 U	0.48 J / 0.49 J	1.0 U
		Cadmium	µg/L	4.6 UJ	1.0 U	1.0 U	1.0 U / 1.0 U	1.0 U
		Calcium	µg/L	275000	5900	12200	58700 / 55700	28900
		Chromium (Total)	µg/L	1180	10.0 U	4.0 J	6.9 J / 5.4 J	5.1 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U / 50.0 U	50.0 U
		Copper	µg/L	50.6	25.0 U	25.0 U	25.0 U / 25.0 U	25.0 U
		Iron	µg/L	7720	867	1360	474 / 471	923
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U
		Magnesium	µg/L	26700	1180 J	2860 J	7550 / 7270	4080 J
		Manganese	µg/L	712	13.3 J	18.4	184 / 170	39.6
		Mercury	µg/L	0.2 U	0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U
		Nickel	µg/L	146	40.0 U	40.0 U	40.0 U / 4.8 J	4.8 J
		Potassium	µg/L	2830	5000 U	5000 U	1880 J / 1780 J	971 J
		Selenium	µg/L	6.0 UJ	5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U
		Silver	µg/L	19.5	10.0 U	10.0 U	10.0 U / 10.0 U	10.0 U
		Sodium	µg/L	106000	1320 J	1760 J	7210 / 6630	3480 J
		Thallium	µg/L	12.35	1.0 U	1.0 U	1.0 U / 1.0 U	0.39 J
		Vanadium	µg/L	50 U	2.4 J	5.2 J	2.1 J / 2.3 J	3.7 J
		Zinc	µg/L	34.1 U	7.7 J	20.0 U	7.7 J / 7.8 J	22.2 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U / 0.50 U	0.50 U
		Chloride	µg/L	258000	0.60 J	1	2.4 / 2.4	1.2
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U / 0.010 U	0.010 U
		Sulfate	µg/L	965000	6.4	9.2	26.5 / 26.7	19.6

TABLE E.6

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations		
					5/2009	8/2009	11/2009
							3/2010

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

⁽¹⁾ Background Values are UTLs on the 95th percentile of the background, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

Values highlighted in **bold** and boxed exceed the background value.

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTT101B	98	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	0.14 J	0.37 J	2.0 U	0.31 J
		Arsenic	µg/L	7.94	0.72 J	1.4	0.64 J	0.68 J
		Barium	µg/L	133	67.5 J	50.6 J	59.3 J	61.8 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	116000	72600	110000	103000
		Chromium (Total)	µg/L	89.1	5.2 J	7.9 J	2.3 J	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	518	477	457	574 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	42100	44300	38400	39500
		Manganese	µg/L	173	55.1	33.4	40.6	35
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	5.3 J	40.0 U	40.0 U
		Potassium	µg/L	7790	19300	47900	10100	16300
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	28700	41100	21800	23800
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	5.8 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.20 J	0.50 U	0.10 J
		Chloride	µg/L	55000	29.8	27.1	29.8	30.4
		Cyanide (total)	µg/L	10 U	0.010 U	0.016	0.039	0.051
		Sulfate	µg/L	430000	109	96.5 J	77.6	63.7

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT102B (Background well)	65.4	Aluminum	µg/L	161	50.0 U / 50.0 U	50.0 U	23.2 J	50.0 U
		Antimony	µg/L	37 U	0.26 J / 2.0 U	0.44 J	2.0 U	0.17 J
		Arsenic	µg/L	7.94	3.9 / 3.9	2.4	3	2.8
		Barium	µg/L	133	101 J / 97.7 J	107 J	101 J	124 J
		Beryllium	µg/L	2.7 U	1.0 U / 1.0 U	1.0 U	0.47 J	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U / 1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	57300 / 53100	45900	57000	62800
		Chromium (Total)	µg/L	89.1	10.0 U / 2.5 J	20.2	6.9 J	8.4 J
		Cobalt	µg/L	50 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U / 25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	564 / 541	857	676	677
		Lead	µg/L	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21400 / 21000	22600	21400	23600
		Manganese	µg/L	173	57.5 / 52.0	37.7	51.9	50.4
		Mercury	µg/L	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U / 40.0 U	7.5 J	3.2 J	3.5 J
		Potassium	µg/L	7790	3610 J / 4780 J	6240 J	2920 J	2750 J
		Selenium	µg/L	5.0 U	5.0 U / 4.4 J	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U / 10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	25000 / 26100	30000	24100	25600
		Thallium	µg/L	9.85	1.0 U / 1.0 U	0.21 J	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U / 50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U / 20.0 U	7.9 J	5.5 J	20.0 U
		Bromide	µg/L	500 U	0.50 U / 0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	46.7 / 1.0 U	49.2	46.7	48.3
		Cyanide (total)	µg/L	10 U	0.010 U / 0.010 U	0.0070 J	0.010 U	0.010 U
		Sulfate	µg/L	430000	44.9 / 1.0 U	45.6	40.8	35.3

TABLE E.7

**COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT112B	59.4	Aluminum	µg/L	161	50.0 U	184	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	3.7	3.8	3.2	3.1
		Barium	µg/L	133	132 J	145 J	136 J	148 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	0.63 J	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	87400	90900	87700	91300
		Chromium (Total)	µg/L	89.1	10.0 U	2.6 J	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1440	1920	1520	1500
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	25300	26300	25600	26900
		Manganese	µg/L	173	112	123	111	113
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	3.5 J	40.0 U	40.0 U
		Potassium	µg/L	7790	1890 J	1740 J	1940 J	2020 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	4.5 J	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21500	24800	24700	24600
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	10.5 J	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	51.5	49.3	47.2	51.7
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	116	102	136	164

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT113B	67.2	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.5	2.7	2.4	2.3
		Barium	µg/L	133	69.0 J	73.9 J	70.7 J	70.4 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	72500	76400	74400	73900
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	15.7
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1220	1260	1240	1290
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	19000	20300	20000	20200
		Manganese	µg/L	173	68.6	68.7	68.8	70.2
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	8.6 J
		Potassium	µg/L	7790	2010 J	1730 J	1930 J	2070 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21500	23000	20200	19600
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.16 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	37.1	34.5	29.7	35
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	37.2	37.9	32.7	38.1

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT114B	65.3	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	8.3	8.2	7.4	7.6
		Barium	µg/L	133	44.4 J	43.8 J	45.0 J	53.2 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	83000	82500	85400	80500
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	2180	2320	2290	2310
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	18100	18200	18700	17900
		Manganese	µg/L	173	37.9 J	40.6	39.1	38.4
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	1120 J	979 J	1070 J	1340 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	25200	19700	20700	39900
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.34 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	49.9	42.8	53.8 J	71.6
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	100	99.1	95.5	97.2

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT116B	58.4	Aluminum	µg/L	161	50.0 U	55.9 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	1.6	0.42 J	1.0 U	1.0 U
		Barium	µg/L	133	135 J	140 J	155 J	167 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	149000	136000	149000	150000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	3840	3520	3810	3890
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	18900	16000	16500	14600
		Manganese	µg/L	173	143	132	141	132
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	4760 J	5390 J	5720	6480
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	24500	19800	21200	23800
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	0.33 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.20 J	0.50 U	0.30 J	0.30 J
		Chloride	µg/L	55000	34.4	35.2	33.9	35.4 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.0095 J
		Sulfate	µg/L	430000	178	184	191	185

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT117B	61.3	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.4	2.5	1.5	1.5
		Barium	µg/L	133	52.9 J	34.3 J	35.5 J	30.6 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	213000	132000	135000	121000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	6200	4100	3710	3160
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21600	16000	15900	17800
		Manganese	µg/L	173	169	130	118	93.1
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.13 J
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	2280 J	1790 J	1920 J	1450 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	31700	21900	20000	20600
		Thallium	µg/L	9.85	0.30 J	1.0 U	1.0 U	0.21 J
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.40 J	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	27.8	39.1	36.2	40.5
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	235	194	169	177

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WT118B	62.5	Aluminum	µg/L	161	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	2.4	3.6 / 3.5	2.3	2.6
		Barium	µg/L	133	58.3 J	57.8 J / 56.7 J	47.4 J	60.7 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	154000	155000 / 153000	130000	163000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U / 25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	4700	5190 / 5160	4120	5510 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	16600	17000 / 16900	13900	18300
		Manganese	µg/L	173	129	133 / 131	111	135
		Mercury	µg/L	0.20 U	0.20 U	0.20 U / 0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U / 40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	3800 J	3620 J / 3560 J	3310 J	3920 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U / 5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U / 10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	21400	21500 / 21300	18500	21900
		Thallium	µg/L	9.85	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U / 50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U / 20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U / 0.50 U	0.50 U	0.50 U
		Chloride	µg/L	55000	33.5	36	32.5	33.3
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U / 0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	430000	181	182	176	193

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTB3	135	Aluminum	µg/L	161	50.0 U	55.7 U	50.0 U	50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	7.94	4.9	5.5	5.1	3.9
		Barium	µg/L	133	64.0 J	71.0 J	73.5 J	63.3 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	86000	72000	77900	84200	74100
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	2.9 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	1870	1230	850	473	405
		Lead	µg/L	3.0 U	2.0 J	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	25300	21900	19800	21700	21700
		Manganese	µg/L	173	158	264	281	193
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	7790	1160 J	1130 J	1150 J	1070 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	31100	16100	14900	15400	15500
		Thallium	µg/L	9.85	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	1.0 U	0.20 J
		Chloride	µg/L	55000	53.5	54.7	47.9	57.4 J
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.02
		Sulfate	µg/L	430000	72.4	68.6	62.5	68.4

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations			
					5/2009	8/2009	11/2009	3/2010
WTE1	81	Aluminum	µg/L	161	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Antimony	µg/L	37 U	2.0 U	2.0 U	2.0 U	2.0 U / 2.0 U
		Arsenic	µg/L	7.94	1.3	2.7	1.6	1.7 / 1.5
		Barium	µg/L	133	41.8 J	45.3 J	36.4 J	42.0 J / 40.6 J
		Beryllium	µg/L	2.7 U	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Cadmium	µg/L	3.05 U	1.0 U	1.0 U	1.0 U	1.0 U / 1.0 U
		Calcium	µg/L	86000	102000	105000	87200	96300 / 94000
		Chromium (Total)	µg/L	89.1	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Copper	µg/L	25 U	25.0 U	25.0 U	25.0 U	25.0 U / 25.0 U
		Iron	µg/L	1870	569	6090	603	176 J / 188 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U / 3.0 U
		Magnesium	µg/L	25300	16400	16300	14400	16100 / 15700
		Manganese	µg/L	173	56.5	232	121	168 / 163
		Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U / 0.20 U
		Nickel	µg/L	40 U	40.0 U	40.0 U	40.0 U	40.0 U / 40.0 U
		Potassium	µg/L	7790	3350 J	3170 J	2530 J	2930 J / 2900 J
		Selenium	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U / 5.0 U
		Silver	µg/L	10 U	10.0 U	10.0 U	10.0 U	10.0 U / 10.0 U
		Sodium	µg/L	31100	18100	16400	16200	17000 / 16400
		Thallium	µg/L	9.85	0.16 J	1.0 U	0.56 J	1.0 U / 1.0 U
		Vanadium	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U / 50.0 U
		Zinc	µg/L	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U / 20.0 U
		Bromide	µg/L	500 U	0.50 U	0.50 U	0.30 J	0.50 U / 0.50 U
		Chloride	µg/L	55000	34.3	31.4	34.4	35.3 / 35.3
		Cyanide (total)	µg/L	10 U	0.010 U	0.010 U	0.010 U	0.010 U / 0.010 U
		Sulfate	µg/L	430000	134	130	103	88.1 / 87.9

TABLE E.7

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Value ¹	Downgradient Well Sample Concentrations		
					5/2009	8/2009	11/2009

3/2010

Notes:

UJ - Estimated reporting limit.

U - Analyte not detected above specified detection limit.

B - Method blank contamination.

J - Analyte was estimated.

⁽¹⁾ Background Values are UTLs on the 95th percentile of the background, with 95 percent confidence.

UTLs are calculated using a method appropriate for the observed data distribution.

Values highlighted in bold and boxed exceed the background value.

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WT101C	165	Aluminum	µg/L	3420	2850	218	78.3	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	8.1	8.2	7.9	8.1
		Barium	µg/L	346	231	93.2 J	82.5 J	77.4 J	78.1 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	49500	49600	43800	47300
		Chromium (Total)	µg/L	33.6	183	4.6 J	2.3 J	10.0 U	2.3 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	1190	1080	896	926 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20100	20300	17800	19200
		Manganese	µg/L	570	468	17.1	15.5	10.8 J	9.5 J
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	3.6 J	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	2800 J	3730 J	4180 J	2720 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	21800	21100	20000	19500
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	8.1 J	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.20 J	0.20 J	0.20 J	0.20 J
		Chloride	µg/L	71800	182000	2.6	2.5	4.1	7.8
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	0.90 J	1.1	1.0 U	1.4

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER

HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WT102C (Background well)	159.5	Aluminum	µg/L	3420	2850	185	489	2010	790
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	0.18 J	0.48 J	0.48 J
		Arsenic	µg/L	5.17	7.61	2.3	2.1	3.1	3.4
		Barium	µg/L	346	231	166 J	177 J	203	224
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	0.57 J	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	65700	59500	97400	74600
		Chromium (Total)	µg/L	33.6	183	10.0 U	8.0 J	8.3 J	5.1 J
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	418	1130	3330	1620
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	1.9 J	3.0 U
		Magnesium	µg/L	60100	37700	27500	28900	45800	31800
		Manganese	µg/L	570	468	168	164	379	331
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	40.0 U	5.7 J	6.4 J	4.3 J
		Potassium	µg/L	3260	5510	1120 J	1700 J	2230 J	1420 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	8640	35400	23500	11000
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	1.4 J	4.5 J	1.6 J
		Zinc	µg/L	40.1	34.1 U	20.0 U	9.7 J	20.9	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.50 U	0.50 U	0.30 J
		Chloride	µg/L	71800	182000	61.5	56.3	53.6	58.2
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	38.3	32.9	22.8	31.2

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTB1	473	Aluminum	µg/L	3420	2850	50.0 U	51.5 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	0.73 J	1.0 U	1.0 U	1.0 U
		Barium	µg/L	346	231	154 J	148 J	161 J	154 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	49000	49300	53800	50300
		Chromium (Total)	µg/L	33.6	183	10.0 U	10.0 U	13.1	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	691	543	682	590
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20000	20100	22100	21100
		Manganese	µg/L	570	468	39.1	39.3	46.5	39.8
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	13.1 J	12.4 J	26.2 J	11.9 J
		Potassium	µg/L	3260	5510	2110 J	1970 J	2130 J	2100 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	56800	56700	61600	59500
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	1.0 U	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	43.6 U	37.6 U	40.6 U	37
		Bromide	µg/L	500 U	500 U	0.20 J	0.20 J	0.5	0.20 J
		Chloride	µg/L	71800	182000	67.2	67.7	66.4	68.3 J
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	1.0 U	1.0 U	1.0 U	1.0 U

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER

HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTB4	173	Aluminum	µg/L	3420	2850	50.0 U	56.5 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	1.4	0.92 J	0.73 J	1.0 U
		Barium	µg/L	346	231	41.5 J	39.6 J	39.2 J	38.5 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	64200	63700	64600	57300
		Chromium (Total)	µg/L	33.6	183	10.0 U	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	414	367	444	110
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	20900	20600	21000	19600
		Manganese	µg/L	570	468	198	195	202	171
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	40.0 U	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	727 J	5000 U	5000 U	787 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	10.0 U	10.0 U
		Sodium	µg/L	70800	87700	3770 J	4020 J	3700 J	4540 J
		Thallium	µg/L	1.0 U	12.35	0.20 J	1.0 U	0.22 J	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U
		Chloride	µg/L	71800	182000	39.1	38.7	37.8	31.4 J
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.010 U	0.010 U	0.010 U
		Sulfate	µg/L	68700	430000	30.7	26.4	31.8	1.5

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
WTE3	176	Aluminum	µg/L	3420	2850	50.0 U	50.0 U	50.0 U	50.0 U
		Antimony	µg/L	1.89	42.2 UJ	2.0 U	2.0 U	2.0 U	2.0 U
		Arsenic	µg/L	5.17	7.61	6	4.6	3.6	3.1
		Barium	µg/L	346	231	57.8 J	58.1 J	48.9 J	51.5 J
		Beryllium	µg/L	4.5 BJ	4.5 BJ	1.0 U	1.0 U	1.0 U	1.0 U
		Cadmium	µg/L	1.0 U	4.6 UJ	1.0 U	1.0 U	1.0 U	1.0 U
		Calcium	µg/L	122000	211000	128000	101000	117000	114000
		Chromium (Total)	µg/L	33.6	183	5.5 J	10.0 U	10.0 U	10.0 U
		Cobalt	µg/L	50 U	50.0 U	50.0 U	50.0 U	1.7 J	50.0 U
		Copper	µg/L	25 U	50.6	25.0 U	25.0 U	25.0 U	25.0 U
		Iron	µg/L	4930	3580	2390	172	2770	648 J
		Lead	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
		Magnesium	µg/L	60100	37700	41700	34900	35600	35600
		Manganese	µg/L	570	468	39.4	32.9	35.8	33.6
		Mercury	µg/L	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
		Nickel	µg/L	27.5	146	4.7 J	40.0 U	40.0 U	40.0 U
		Potassium	µg/L	3260	5510	3450 J	2790 J	3040 J	3150 J
		Selenium	µg/L	5.0 U	6.0 UJ	5.0 U	4.8 J	5.0 U	5.0 U
		Silver	µg/L	10 U	19.5	10.0 U	10.0 U	2.4 J	10.0 U
		Sodium	µg/L	70800	87700	22100	17800	18800	18700
		Thallium	µg/L	1.0 U	12.35	1.0 U	1.0 U	0.16 J	1.0 U
		Vanadium	µg/L	58.6	50 U	50.0 U	50.0 U	50.0 U	50.0 U
		Zinc	µg/L	40.1	34.1 U	20.0 U	20.0 U	20.0 U	20.0 U
		Bromide	µg/L	500 U	500 U	0.50 U	0.10 J	0.50 U	0.50 U
		Chloride	µg/L	71800	182000	25.9	17.2	25.5	24.5
		Cyanide (total)	µg/L	10 U	10 U	0.010 U	0.088	0.010 U	0.013
		Sulfate	µg/L	68700	430000	186	55.5	160	124

TABLE E.8

COMPARISON OF RECENT (2009-2010) SITE DATA VS. BACKGROUND VALUES -- LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Monitoring Well	Sample Depth (ft)	Analyte	Units	Background Values		Downgradient Well Sample Concentrations			
				Lower-Aquifer ¹	Combined-Aquifers ¹	5/2009	8/2009	11/2009	3/2010
<u>Notes:</u>									
UJ - Estimated reporting limit.									
U - Analyte not detected above specified detection limit.									
B - Method blank contamination.									
J - Analyte was estimated.									
(1) Background Values are UTLs on the 95th percentile of the background, with 95 percent confidence.									
UTLs are calculated using a method appropriate for the observed data distribution.									
Values highlighted in bold and boxed exceed the lower-aquifer or combined-aquifer background value.									
Values highlighted in bold and double-boxed exceed both the lower-aquifer and combined-aquifer background values.									

TABLE E.9
TREND TESTS RESULTS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT101A							
	1,1-Dichloroethane	µg/L	6	0%	5	0.452	No trend identified
	Benzene	µg/L	6	0%	-1	1.000	No trend identified
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-5	0.452	No trend identified
	Carbon disulfide	µg/L	6	67%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	5	0%	2	0.806	No trend identified
	Iron	µg/L	6	0%	-5	0.452	No trend identified
	Manganese	µg/L	6	0%	-3	0.707	No trend identified
	Sulfate	µg/L	6	0%	-2	0.851	No trend identified
	Vinyl chloride	µg/L	3	0%	--	--	Insufficient data
WT102A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-7	0.260	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	7	0.260	No trend identified
	Manganese	µg/L	6	0%	9	0.133	No trend identified
	Sulfate	µg/L	6	0%	1	1.000	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT103A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	100%	--	--	100% ND
	Calcium	µg/L	6	0%	-5	0.452	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	7	0.260	No trend identified
	Manganese	µg/L	6	0%	-11	0.060	No trend identified
	Sulfate	µg/L	6	0%	-3	0.707	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT104A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	-5	0.452	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	83%	--	--	>50% ND
	Manganese	µg/L	6	67%	--	--	>50% ND
	Sulfate	µg/L	6	0%	-3	0.707	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND

TABLE E.9

TREND TESTS RESULTS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT105A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	11	0.060	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-5	0.452	No trend identified
	Manganese	µg/L	6	0%	-9	0.133	No trend identified
	Sulfate	µg/L	6	0%	-11	0.060	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT106A							
	1,1-Dichloroethane	µg/L	6	0%	10	0.091	No trend identified
	Benzene	µg/L	3	0%	--	--	Insufficient data
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	100%	--	--	100% ND
	Calcium	µg/L	6	0%	9	0.133	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	0%	5	0.452	No trend identified
	Iron	µg/L	6	0%	9	0.133	No trend identified
	Manganese	µg/L	6	0%	9	0.133	No trend identified
	Sulfate	µg/L	6	0%	11	0.060	No trend identified
	Vinyl chloride	µg/L	6	67%	--	--	>50% ND
WT111A							
	1,1-Dichloroethane	µg/L	6	0%	-5	0.452	No trend identified
	Benzene	µg/L	6	0%	3	0.707	No trend identified
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	100%	--	--	100% ND
	Calcium	µg/L	6	0%	-3	0.707	No trend identified
	Carbon disulfide	µg/L	3	0%	--	--	Insufficient data
	cis-1,2-Dichloroethene	µg/L	6	0%	-5	0.452	No trend identified
	Iron	µg/L	6	0%	-3	0.707	No trend identified
	Manganese	µg/L	6	0%	1	1.000	No trend identified
	Sulfate	µg/L	6	0%	-3	0.707	No trend identified
	Vinyl chloride	µg/L	5	0%	-1	1.000	No trend identified
WT112A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	2	0.851	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	17%	-7	0.260	No trend identified
	Manganese	µg/L	6	0%	-7	0.260	No trend identified
	Sulfate	µg/L	6	0%	3	0.707	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND

TABLE E.9

**TREND TESTS RESULTS – UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT113A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-7	0.260	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	100%	--	--	100% ND
	Manganese	µg/L	5	0%	-2	0.806	No trend identified
	Sulfate	µg/L	6	0%	-11	0.060	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT114A							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	80%	--	--	>50% ND
	Calcium	µg/L	6	0%	3	0.707	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	7	0.260	No trend identified
	Manganese	µg/L	6	0%	-5	0.452	No trend identified
	Sulfate	µg/L	6	0%	-1	1.000	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT115A							
	1,1-Dichloroethane	µg/L	6	17%	4	0.573	No trend identified
	Benzene	µg/L	6	0%	2	0.851	No trend identified
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	3	0.707	No trend identified
	Carbon disulfide	µg/L	6	33%	0	1.000	No trend identified
	cis-1,2-Dichloroethene	µg/L	5	0%	2	0.806	No trend identified
	Iron	µg/L	6	0%	-11	0.060	No trend identified
	Manganese	µg/L	6	0%	-7	0.260	No trend identified
	Sulfate	µg/L	6	0%	1	1.000	No trend identified
	Vinyl chloride	µg/L	5	0%	2	0.806	No trend identified
WT116A							
	1,1-Dichloroethane	µg/L	3	0%	--	--	Insufficient data
	Benzene	µg/L	3	0%	--	--	Insufficient data
	Carbon disulfide	µg/L	3	67%	--	--	Insufficient data
	cis-1,2-Dichloroethene	µg/L	3	0%	--	--	Insufficient data
	Vinyl chloride	µg/L	3	0%	--	--	Insufficient data
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	3	67%	--	--	Insufficient data
	Calcium	µg/L	3	0%	--	--	Insufficient data
	Iron	µg/L	3	0%	--	--	Insufficient data
	Manganese	µg/L	3	0%	--	--	Insufficient data
	Sulfate	µg/L	3	0%	--	--	Insufficient data

TABLE E.9

TREND TESTS RESULTS -- UPPER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT117A							
	1,1-Dichloroethane	µg/L	4	0%	-2	0.750	No trend identified
	Benzene	µg/L	6	83%	--	--	>50% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	100%	--	--	100% ND
	Calcium	µg/L	6	0%	-1	1.000	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	83%	--	--	>50% ND
	Iron	µg/L	6	0%	-7	0.260	No trend identified
	Manganese	µg/L	6	0%	-3	0.707	No trend identified
	Sulfate	µg/L	6	0%	-3	0.707	No trend identified
	Vinyl chloride	µg/L	6	83%	--	--	>50% ND

Notes:

Trend tests were carried out using the Mann-Kendall test considering all available data collected between 2008-2010.

100% ND -- The analyte was not detected in any of the monitoring samples collected at this well. No trend test was performed.

>50% ND -- Analyte was detected in fewer than half the monitoring samples collected at this well. No trend test was performed.

No trend identified -- The Mann-Kendall test did not detect a significant trend above 95 percent confidence.

Decreasing Trend -- A significant (above 95% confidence) decreasing trend in analytes concentrations over time was detected.

Increasing Trend -- A significant (above 95% confidence) increasing trend in analytes concentrations over time was detected.

TABLE E.10

**TREND TESTS RESULTS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT101B							
	1,1-Dichloroethane	µg/L	6	0%	9	0.133	No trend identified
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	100%	--	--	100% ND
	Calcium	µg/L	6	0%	7	0.260	No trend identified
	Carbon disulfide	µg/L	5	0%	2	0.806	No trend identified
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	9	0.133	No trend identified
	Manganese	µg/L	6	0%	7	0.260	No trend identified
	Sulfate	µg/L	6	0%	-15	0.009	Decreasing Trend
	Vinyl chloride	µg/L	4	0%	4	0.334	No trend identified
WT102B							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	100%	--	--	100% ND
	Calcium	µg/L	6	0%	9	0.133	No trend identified
	Carbon disulfide	µg/L	6	67%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	9	0.133	No trend identified
	Manganese	µg/L	6	0%	-3	0.707	No trend identified
	Sulfate	µg/L	6	0%	-13	0.024	Decreasing Trend
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT112B							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	-5	0.452	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-1	1.000	No trend identified
	Manganese	µg/L	6	0%	-7	0.260	No trend identified
	Sulfate	µg/L	6	0%	1	1.000	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT113B							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-1	1.000	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	3	0.707	No trend identified
	Manganese	µg/L	6	0%	5	0.452	No trend identified
	Sulfate	µg/L	6	0%	5	0.452	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND

TABLE E.10

**TREND TESTS RESULTS -- INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT114B							
	1,1-Dichloroethane	µg/L	6	0%	-5	0.452	No trend identified
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	4	100%	--	--	100% ND
	Calcium	µg/L	6	0%	-9	0.133	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	0%	6	0.348	No trend identified
	Iron	µg/L	6	0%	2	0.851	No trend identified
	Manganese	µg/L	6	0%	-1	1.000	No trend identified
	Sulfate	µg/L	6	0%	3	0.707	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT116B							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	-5	0.452	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-1	1.000	No trend identified
	Manganese	µg/L	6	0%	-8	0.188	No trend identified
	Sulfate	µg/L	6	0%	11	0.060	No trend identified
	Vinyl chloride	µg/L	5	0%	6	0.221	No trend identified
WT117B							
	1,1-Dichloroethane	µg/L	6	17%	-7	0.260	No trend identified
	Benzene	µg/L	4	0%	-4	0.334	No trend identified
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	100%	--	--	100% ND
	Calcium	µg/L	6	0%	-7	0.260	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	5	0%	-8	0.086	No trend identified
	Iron	µg/L	6	0%	-7	0.260	No trend identified
	Manganese	µg/L	6	0%	-6	0.348	No trend identified
	Sulfate	µg/L	6	0%	-7	0.260	No trend identified
	Vinyl chloride	µg/L	4	0%	-6	0.084	Decreasing Trend
WT118B							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	100%	--	--	100% ND
	Calcium	µg/L	6	0%	2	0.851	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	5	0.452	No trend identified
	Manganese	µg/L	6	0%	5	0.452	No trend identified
	Sulfate	µg/L	6	0%	3	0.707	No trend identified
	Vinyl chloride	µg/L	6	0%	2	0.851	No trend identified

TABLE E.10

**TREND TESTS RESULTS – INTERMEDIATE AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WTB3							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	7	0.260	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-15	0.009	Decreasing Trend
	Manganese	µg/L	6	0%	-3	0.707	No trend identified
	Sulfate	µg/L	6	0%	-7	0.260	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WTE1							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-1	1.000	No trend identified
	Carbon disulfide	µg/L	6	67%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-5	0.452	No trend identified
	Manganese	µg/L	6	0%	7	0.260	No trend identified
	Sulfate	µg/L	6	0%	-15	0.009	Decreasing Trend
	Vinyl chloride	µg/L	6	67%	--	--	>50% ND

Notes:

Trend tests were carried out using the Mann-Kendall test considering all available data collected between 2008-2010.

100% ND – The analyte was not detected in any of the monitoring samples collected at this well. No trend test was performed.

>50% ND – The analyte was detected in fewer than half the monitoring samples collected at this well. No trend test was performed.

No trend identified – The Mann-Kendall test did not detect a significant trend above 95 percent confidence.

Decreasing Trend – A significant (above 95% confidence) decreasing trend in analytes concentrations over time was detected.

Increasing Trend – A significant (above 95% confidence) increasing trend in analytes concentrations over time was detected.

TABLE E.11

**TREND TESTS RESULTS – LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA**

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WT101C							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-1	1.000	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-9	0.133	No trend identified
	Manganese	µg/L	6	0%	-11	0.060	No trend identified
	Sulfate	µg/L	5	0%	7	0.142	No trend identified
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WT102C							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5	0%	-2	0.806	No trend identified
	Calcium	µg/L	6	0%	9	0.133	No trend identified
	Carbon disulfide	µg/L	6	83%	--	--	>50% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	3	0.707	No trend identified
	Manganese	µg/L	6	0%	9	0.133	No trend identified
	Sulfate	µg/L	6	0%	-13	0.024	Decreasing Trend
	Vinyl chloride	µg/L	6	100%	--	--	100% ND
WTB1							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	9	0.133	No trend identified
	Carbon disulfide	µg/L	6	100%	--	--	100% ND
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	3	0.707	No trend identified
	Manganese	µg/L	6	0%	13	0.024	Increasing Trend
	Sulfate	µg/L	5	100%	--	--	100% ND
	Vinyl chloride	µg/L	6	83%	--	--	>50% ND
WTB4							
	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	67%	--	--	>50% ND
	Calcium	µg/L	6	0%	3	0.707	No trend identified
	Carbon disulfide	µg/L	4	0%	2	0.750	No trend identified
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-9	0.133	No trend identified
	Manganese	µg/L	6	0%	-1	1.000	No trend identified
	Sulfate	µg/L	6	0%	-11	0.060	No trend identified
	Vinyl chloride	µg/L	6	83%	--	--	>50% ND

TABLE E.11

TREND TESTS RESULTS -- LOWER AQUIFER
HIMCO SITE
ELKHART, INDIANA

Well	Analyte	Units	Number of Samples	Percent non-detects	Mann-Kendall Trend Test		
					Statistic	Probability	Conclusion
WTE3	1,1-Dichloroethane	µg/L	6	100%	--	--	100% ND
	Benzene	µg/L	6	100%	--	--	100% ND
	bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	83%	--	--	>50% ND
	Calcium	µg/L	6	0%	-7	0.260	No trend identified
	Carbon disulfide	µg/L	5	0%	-2	0.806	No trend identified
	cis-1,2-Dichloroethene	µg/L	6	100%	--	--	100% ND
	Iron	µg/L	6	0%	-9	0.133	No trend identified
	Manganese	µg/L	6	0%	-9	0.133	No trend identified
	Sulfate	µg/L	6	0%	-9	0.133	No trend identified
	Vinyl chloride	µg/L	6	0%	2	0.851	No trend identified

Notes:

Trend tests were carried out using the Mann-Kendall test considering all available data collected between 2008-2010.

100% ND -- The analyte was not detected in any of the monitoring samples collected at this well. No trend test was performed.

>50% ND -- The analyte was detected in fewer than half the monitoring samples collected at this well. No trend test was performed.

No trend identified -- The Mann-Kendall test did not detect a significant trend above 95 percent confidence.

Decreasing Trend -- A significant (above 95% confidence) decreasing trend in analytes concentrations over time was detected.

Increasing Trend -- A significant (above 95% confidence) increasing trend in analytes concentrations over time was detected.



**CONESTOGA-ROVERS
& ASSOCIATES**

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September 15, 2010

Reference No. 039611

Mr. Rosauro del Rosario
EPA Project Manager/Coordinator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Dear Mr. del Rosario:

Re: Response to Comments - Annual Groundwater Monitoring Report
Himco Site, Elkhart, Indiana (Site)

Please find enclosed Conestoga-Rovers & Associates' (CRA's) responses to the United States Environmental Protection Agency's (USEPA's) comments dated August 19, 2010 regarding the Annual Groundwater Monitoring Report (CRA, July 2010) for the Himco Site. CRA has prepared this letter on behalf of the Himco Site Trust.

For convenience, the USEPA's comments have been repeated verbatim below in italic font and CRA's responses are presented directly after each comment. Replacement pages for insert into your existing copy(ies) of the report have been provided as an attachment to this letter.

GENERAL COMMENTS

General Comment No. 1

The lack of a groundwater contaminant plume map has been an issue since the Agency first reviewed the Phase 1 Groundwater Investigation Report in 2009. As a condition of approving this subject report, EPA has stated that Phase II must include such a plume map. Such a plume map provides a clearer picture of risks, if any, site-related contaminants in groundwater currently have on the surrounding community. Please ensure that such information will be included in the Phase II report.

CRA Response No. 1

The Phase I Groundwater Investigation Report (CRA, May 2009) included plume maps for iron, calcium, manganese and sulfate. Select volatile organic compound (VOC) and semi-volatile organic compound (SVOC) results were shown on maps but the data were not contoured.



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Reference No. 039611

VOCs and SVOCs have not been detected in most groundwater samples from this Site, and when they have been detected, it has been at very low concentrations and not consistent with a typical contaminant plume emanating from a landfill.

CRA believed that we had addressed USEPA's prior comment by including the plume maps for metals. CRA will seek clarification from USEPA on the contaminants the reviewer wishes to see included in the plume maps and will provide these in the Phase II Groundwater Investigation Report.

SPECIFIC COMMENTS

Specific Comment No. 1

P.6, section 2.3, last paragraph, general. Incorporate reference to EPA Method Manuals followed, or reference to Appendix C, Table 2. Please modify accordingly.

CRA Response No. 1

Concur. Please see revised text on the replacement page provided in Attachment A.

Specific Comment No. 2

P.15, section 5.1, Table. 1,1-DCA is repeated -.presented as first and last entry of the table. Delete one.

CRA Response No. 2

Concur. Please see the attached replacement page provided in Attachment A.

Specific Comment No. 3

P.16, section 5.2, 1st paragraph, 1st sentence and P.22, section 5.3, 1st paragraph, 1st sentence. Use of the term 'parameters' in this context is atypical, and is more clearly stated by using 'compounds' or 'analytes'. Please modify accordingly

CRA Response No. 3

Concur. Please see revised text on the replacement page provided in Attachment A.



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Reference No. 039611

Specific Comment No. 4

Appendix C -. Laboratory Reports and Data Validation Memorandum.

- a. *From the review of Chain-of-custodies, it appears that water samples are being held 1-3 days prior to shipment by FedEx to the laboratory. In general, this long of a delay before shipment is not recommended, and puts into question the conditions that samples are maintained during that critical interim timeframe. To ensure the validity of data and samples, field temporary storage must be discussed and documented in field logs and summarized in report text - especially how and where they are stored to ensure sample preservation and sample custody is maintained.*
- b. *Method Blank evaluation criteria used is taken from out-dated (1999) CLP NFG guidance. The 5 and 10 times rules employed here have been modified in June 2008 NFG for Organic Methods update. Suggest updated NFG versions be employed in future events to ensure data is not un-necessarily being qualified as non-detect (U), especially BEHP.*
- c. *A thorough method-specific instrumental performance check or calibration data review is not being completed in the data validation process. The text summarizes the case narrative description as the validation done for these topics. For instance, data is normally rejected if the CCV fails, yet the data for potassium is just qualified with a J as estimated.*
- d. *Suggest including the (data) results for all qualified data tables (when only the flags are present), to enable an evaluation of the field samples concentration and potential impact to usability for the QC failures.*
- e. *Prep methods should be included in Table 2 for completeness of record. This is especially important for SVOC, metals, and VOCs — for various options exist.*

CRA Response No. 4

- a.

The 15 samples shipped on February 25, 2010 consisted of: a trip blank and three investigative samples collected during the afternoon of February 23; five investigative samples, an equipment blank, and a field duplicate sample collected on February 24; and four investigative samples collected on February 25. No samples were held for three days prior to being shipped. Samples collected for this project are typically shipped daily to the analytical laboratory. The samples are typically packaged for transport and dropped off at the courier service each afternoon. Consistent with the Field Sampling Plan (CRA, 2008), samples collected after that day's shipment has been packaged and shipped are maintained on ice in a secure location until they are packaged and shipped with the samples collected the following day.



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Reference No. 039611

- b. The procedure used to evaluate sample data associated with method blank contamination was consistent with the evaluation procedure specified in the approved Quality Assurance Project Plan (QAPP)(CRA, 2009) and the data validation standard operating procedure (SOP) included as Attachment B of the approved QAPP. The June 2008 USEPA Contract Laboratory Program (CLP) data review document was written to provide guidance to data reviewers in determining the usability of analytical data produced by the methods contained in "USEPA Contract Laboratory Program Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, SOM01.2" ("SOM01.2 SOW") and any future editorial revisions of SOM01.2 SOW. Moreover, the introduction of the June 2008 CLP guidance document states that "use of this document to evaluate data generated under Organic SOWs other than the SOM01.2 SOW is cautioned". Therefore, applying the method blank contamination evaluation procedure in the June 2008 CLP guidance document to data produced by laboratory methods based on EPA SW-846 procedures is not appropriate, and the method blank evaluation criteria specified in the approved QAPP will continue to be used.

The bis(2-ethylhexyl)phthalate results in the annual report that were qualified as non-detected for method blank contamination would not have changed had the evaluation procedure in the June 2008 CLP guidance document been used.

- c. Section 10.2.2 of the approved QAPP specifies that complete data deliverable packages will be obtained from the laboratory as deemed necessary during the data review process. The complete data package was obtained, and the potassium continuing calibration verification (CCV) data were reviewed. The potassium CCV standard that exceeded the upper percent recovery control limit, which is 110%, was recovered at 110.9%. In this situation (CCV data within the range of 111% to 125% recovery), the results for detected analytes are qualified as estimated and the results for non-detected analytes are not qualified. The text of the memorandum has been revised to include the percent recovery of the CCV standard to clarify the reason the potassium results were qualified as estimated (J). The revised page with the text modification is provided in Attachment A.
- d. Concur. Memoranda prepared for future monitoring events will include both the result value and qualifier.
- e. Concur. Memoranda prepared for future monitoring events will include both the preparation method and analysis method.



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Reference No. 039611

Specific Comment No. 5

Figure 1.2 should show the CDA boundary. Please modify accordingly.

CRA Response No. 5

Concur. The revised figure is provided in Attachment A.

Specific Comment No. 6

Figure 4.1, groundwater contour 755.5 is drawn on the wrong side of monitoring well WT111A. Please modify accordingly.

CRA Response No. 6

Concur. The revised figure is provided in Attachment A.

Specific Comment No. 7

Figure 4.5 - Please complete the groundwater contours on the south part of the site (756 and 755.5).

CRA Response No. 7

Concur. The revised figure is provided in Attachment A. Since SURFER does not generate contours beyond the extents of available data points, in this case south of WT101B and WTE1, CRA manually extrapolated the contours to the southern Site boundary on the revised Figure 4.5.

Specific Comment No. 8

Figure 4.6, Should groundwater contour 756.5 be shown at the very top of the map since WT 102B is not shown on the correct spot on the map it is actually 1200 feet farther north? Is surfer taking that into account? Please explain.



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Reference No. 039611

CRA Response No. 8

The contours were created using the actual location of WT102B. The location of the 756.5 contour is correct as shown on Figure 4.6.

Specific Comment No. 9

Figure 4.6, Was the groundwater elevation for WT101B double checked? Comparing that water level to all the other data, one may think if there was a mistake. That point creates a localized groundwater high where groundwater is usually flowing south. Please clarify.

CRA Response No. 9

The WT101B groundwater elevation data are correct. The groundwater elevation at WT101B fluctuates. Attachment B includes a hydrograph that shows the groundwater elevations measured in WT101A, WT101B and WT101C during the synoptic groundwater elevation monitoring rounds and the quarterly groundwater sampling rounds. WT101A is screened in a sand layer above WT101B, and WT101C is screened in a sand layer above WT101B. The groundwater elevations measured in WT101A and WT101C have been consistently very similar. The groundwater elevation measured in WT101B is not always similar to the groundwater elevations measured in WT101A and WT101C. WT101B is screened in silty sand as opposed to sand, like WT101A and WT101C, which may affect the local groundwater elevations.

Specific Comment No. 10

Figure 5.9, Should calcium concentration contour 200 be extended southeast to include WT115A and WT101A? Concentrations in both wells are consistently above 200. Please evaluate and modify accordingly.

CRA Response No. 10

The label for calcium concentration contour "200" is incorrect and should be "250". CRA has corrected the label and a revised Figure 5.9 is provided in Attachment A. The length of the contour is unchanged.



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Reference No. 039611

Specific Comment No. 11

Figure 5.12, WT11A is on wrong side of the 200 contour line, with all but one analysis out of four above 200. Plus, the plume could be extended to the southeast to incorporate monitoring wells WT115A and WT101A; both wells have sulfate concentrations above 200. Please modify accordingly.

CRA Response No. 11

The label for sulphate concentration contour "200" is incorrect and should be "250". CRA has corrected the label and a revised Figure 5.12 is provided in Attachment A. The position of the contour is unchanged. CRA based the contours on the average of the concentrations for the last four monitoring rounds. The average sulfate concentration in the four groundwater samples collected from WT115A is 186 mg/L. Therefore, the 250 mg/L sulfate concentration contour on the revised Figure 5.12 does not encompass WT115A.

Specific Comment No. 12

All calcium and sulfate concentration figures. The text in Section 5 refers to the 250 contour defining the plume as the secondary MCL. Why is the 200 contour shown on the figures? Shouldn't the 250 contour be plotted on the figures to keep consistent with the text.

CRA Response No. 12

See Response to Comments Nos. 11 and 12. The "200" concentration contours were incorrectly labeled and the labels have been corrected to "250" on the revised figures provided in Attachment A.

Specific Comment No. 13

Section 5.2.2 - 1,1-Dichloroethane - In the text discussing wells where 1,1-DCA was detected, WT117B is listed twice. Perhaps one of these should be WT117A. Please correct.

CRA Response No. 13

Correct. A replacement page is provided in Attachment A.



Specific Comment No. 14

Section 5.2.2 - 1,1-Dichloroethane - Although there is no regulatory MCL for 1,1-DCA, consider including a comparison to the tapwater Regional Screening Level of 2.4 µg/L to provide an indication of potential risk concern for this chemical.

CRA Response No. 14

Maximum Contaminant Level (MCLs) are the enforceable standards set by USEPA for public drinking water. MCLs are both commonly used and widely accepted. Since there is no MCL for 1,1-DCA, it is not unreasonable to use the Regional Screening Level (RSL) Tapwater as a screening criterion; however, the RSL of 2.4 µg/L is based on an excess cancer risk of 1×10^{-6} , which is overly conservative given that the Site is in the RD/RA stage. At this point in the RD/RA, it is more appropriate to use a screening level based on an excess cancer risk of 1×10^{-4} .

As such, the following text has been inserted into Section 5.2.2 (see Attachment A):

In the absence of a MCL for 1,1-DCA, USEPA has requested that the PSDs consider the Regional Screening Levels (RSL) Tapwater. The RSL Tapwater for 1,1-DCA is 2.4 µg/L assuming a Carcinogenic Total Risk (TR) of 1×10^{-6} [USEPA Regional Screening Level (RSL) Tapwater Supporting Table, May 2010]; the RSL for 1,1-DCA would therefore be 240 µg/L assuming an excess cancer risk of 1×10^{-4} . Consistent with the approach used on other sites for the application of screening levels, it is appropriate, therefore, in the absence of a MCL, to consider an RSL Tapwater of 240 µg/L for 1,1-DCA when evaluating groundwater data for the Site.

1,1-DCA was detected in groundwater samples at concentrations ranging from 0.23 µg/L to 7.4 µg/L. Additional text has also been inserted into Section 5.2.2 to indicate that there were no detections of 1,1-DCA at concentrations above the calculated RSL Tapwater ($TR = 1 \times 10^{-4}$).

Specific Comment No. 15

Section 5.2.5 - Carbon disulfide - Consider including a comparison to the tapwater Regional Screening Level of 1,000 µg/L.

CRA Response No. 15

As indicated in the Response to Specific Comment No. 14, MCLs are the enforceable standards set by USEPA for public drinking water. MCLs are both commonly used and widely accepted. Since there is no MCL for carbon disulfide, it is not unreasonable to use the RSL Tapwater as a screening criterion, provided that it is recalculated to reflect an appropriate carcinogenic total



**CONESTOGA-ROVERS
& ASSOCIATES**

September 15, 2010

9

Reference No. 039611

risk. Although carbon disulfide concentrations in groundwater samples from the Site ranged from 0.29 J $\mu\text{g/L}$ to 3.6 J $\mu\text{g/L}$ and are below the RSL Tapwater, the RSL of 1,000 $\mu\text{g/L}$ is based on an excess cancer risk of 1×10^{-6} , which is overly conservative given that the Site is in the RD/RA stage. Similar to the approach described in Response to Specific Comment No. 14, CRA calculated the RSL Tapwater for an excess cancer risk of 1×10^{-4} and has revised the text of Section 5.2.5 accordingly. The revised text and associated replacement pages are provided in Attachment A.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Denise Gay Quigley

HS/cb/25

Encl.

cc: Doug Petroff, IDEM (2 copies)
Kevin M. Howe, USACE (3 copies)
Gary Toczyłowski, Bayer HealthCare
Tom Lenz, Bayer HealthCare
Alan Van Norman, CRA (electronic)
Alan Deal, CRA



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November 4, 2010

Reference No. 039611

Mr. Rosauro del Rosario
EPA Project Manager/Coordinator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Dear Mr. del Rosario:

Re: Response to Comments – Annual Groundwater Monitoring Report
Himco Site, Elkhart, Indiana (Site)

Please find enclosed Conestoga-Rovers & Associates' (CRA's) responses to the United States Environmental Protection Agency's (USEPA's) letter and email correspondence dated September 28, 2010. Specifically, you provided additional information pertaining to General Comment #1 and Specific Comment #14 from your August 19, 2010 correspondence. CRA has prepared this letter on behalf of the Himco Site Trust to address your comments and submit the requested report revisions.

Revised Response to USEPA General Comment No. 1 dated August 19, 2010

In your email dated September 28, 2010, USEPA requested that the Trust provide isoconcentration contour drawings (or "plume maps") for 12 additional parameters in a "revised report". USEPA's original comment stated that additional plume maps should be included in the Phase II Groundwater Investigation Report. Therefore, as requested, the requested plume maps were included in the Phase II Groundwater Investigation Report submitted to USEPA on October 28, 2010. For the five metals parameters (arsenic, beryllium, chromium, lead, and thallium), plume maps were generated for those aquifers and parameters where at least one groundwater sample in the sample set exceeded the Maximum Contaminant Level (MCL). This approach is consistent with USEPA's comment, which requests that plume maps be created "for the five metals that have been detected above an associated primary MCL".

Revised Response to Specific Comment No. 14 dated August 19, 2010

In your September 28, 2010 letter, USEPA stated that "Bayer shall use a risk based concentration for 1,1-DCA corresponding to a 10^{-5} risk (24 µg/L). The revised groundwater report shall reflect this cleanup goal for this COC." CRA finds this approach acceptable, provided that the value of 24 µg/L 1,1-DCA shall be used as a screening level for further evaluation, as noted in the



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November 4, 2010

2

Reference No. 039611

guidance for the Regional Screening Level (RSL) Tapwater, as opposed to a "cleanup goal". The text of the report (Section 5.2.2) has been revised accordingly, and replacement pages are attached. The report text for carbon disulfide (Section 5.2.5) has also been revised accordingly to be consistent with this approach.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Denise Gay Quigley

DT/cb/29

Encl.

cc: Doug Petroff, IDEM (2 copies)
Kevin M. Howe, USACE (3 copies)
Gary Toczyłowski, Bayer HealthCare
Tom Lenz, Bayer HealthCare
Alan Van Norman, CRA (electronic)
Alan Deal, CRA

Benzene was also detected in routine groundwater monitoring samples collected from six other monitoring wells, as follows:

<i>Well</i>	<i>Number of detections/Number of samples</i>	<i>Range of Concentrations (µg/L)</i>
WT101A	6/6	1.2 - 3.3
WT106A	3/6	1.0 U - 0.51 J
WT111A	6/6	0.28 J - 0.83 J
WT116A	3/3	1.7 - 3.8
WT117A	1/6	1.0 U - 0.71 J
WT117B	4/6	1.0 U - 0.66 J
J - estimated concentration		
U - not detected at the associated value		

As shown on Figure 5.1, these monitoring well are located along the southern limit of waste or, in the case of WT106B, south of the southeast corner of the Site. Six of the wells are in the Upper Aquifer with WT117B in the Intermediate Aquifer. The pattern of widespread, low concentration VOCs along the southern edge of the landfill suggests a relatively weak, local source of benzene somewhere in the vicinity of WT115A.

5.2.2 1,1-DICHLOROETHANE (1,1-DCA)

As summarized in Table 5.2, 1,1-DCA was detected in 50 of 177 routine groundwater samples collected from the monitoring well network, or 28.1 percent of the samples. The range of concentrations for the samples where 1,1-DCA was detected range from 0.23 J µg/L to 7.4 µg/L. There is no MCL for 1,1-DCA.

One of the Remedial Action Objectives (RAOs) for groundwater is "to prevent the use of groundwater which contains carcinogens in excess of MCLs or that present a total excess cancer risk above EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} for all site related contaminants...". In the absence of a MCL for 1,1-DCA, USEPA has requested that the PSDs consider the Regional Screening Levels (RSL) Tapwater. The RSL Tapwater for 1,1-DCA is 2.4 µg/L assuming a Carcinogenic Total Risk (TR) of 1×10^{-6} [USEPA Regional Screening Level (RSL) Tapwater Supporting Table, May 2010]; the RSL for 1,1-DCA would therefore be 24 µg/L assuming an excess cancer risk of 1×10^{-5} . It is appropriate, therefore, in the absence of a MCL, to consider an RSL Tapwater of 24 µg/L for 1,1-DCA when evaluating groundwater data for the Site.

1,1-DCA was detected in routine groundwater monitoring samples collected from the following monitoring wells:

Well	Number of detections/Number of samples	Range of Concentrations (µg/L)
WT101A	6/6	2.1 - 5.2
WT101B	6/6	0.29 J - 1.2
WT106A	6/6	1.2 - 1.7
WT111A	6/6	1.9 - 6.5
WT114B	6/6	1.9 - 2.3
WT115A	7/9	1.0 U - 4.1
WT116A	3/3	5.0 - 7.4
WT117A	5/7	1.0 U - 5.0
WT117B	5/6	1.0 U - 6.3
J - estimated concentration		
U - not detected at the associated value		

As shown on Figure 5.1, 1,1-DCA was detected in groundwater samples collected during the routine groundwater monitoring at wells WT101A, WT101B, WT111A, WT115A, WT116A, WT117A, and WT117B, located along the southern Site boundary. 1,1-DCA was not detected in any groundwater samples at concentrations above the calculated RSL Tapwater of 24 µg/L. 1,1-DCA was not detected at a reporting detection limit (RDL) of 1.0 µg/L in groundwater samples collected from WT104A and WT105A, located south of the Site. However, it was detected in the groundwater samples collected from WT106A, located south of the southeast corner of the Site. 1,1-DCA was detected east of the Site in groundwater samples collected from Intermediate Aquifer monitoring well WT114B, but at a concentration less than the calculated RSL Tapwater. 1,1-DCA was not detected in groundwater samples collected from Upper Aquifer monitoring well WT114A.

The pattern of widespread, low-concentration 1,1-DCA detections is not consistent with a distinct, high-concentration VOC source. The distribution of 1,1-DCA in groundwater at the Site is more consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

monitoring will provide data to evaluate the presence/absence of vinyl chloride in groundwater samples collected from WTB1 and WTB4.

Vinyl chloride was not detected (RDL=1.0 µg/L) east of the Site in groundwater samples collected from monitoring well WT114A and WT114B.

The widespread low level vinyl chloride detections in the routine groundwater monitoring samples do not suggest a distinct source with a high concentration VOC plume emanating from the landfill. Vinyl chloride is produced in reducing environments by the degradation of chlorinated organic compounds such as TCE. The distribution of vinyl chloride in groundwater in the vicinity of the Himco Site is more consistent with residual contamination undergoing degradation, probably with no ongoing source of VOC contaminants.

5.2.5 CARBON DISULFIDE

Carbon disulfide was detected in 37 of 177 routine groundwater samples, or 20.9 percent of the samples. The concentrations for the samples where carbon disulfide was detected range from 0.29 J µg/L to 3.6 J µg/L. There is no MCL for carbon disulfide.

In the absence of a MCL for carbon disulfide, USEPA has requested that the PSDs consider the Regional Screening Levels (RSL) Tapwater. The RSL Tapwater for carbon disulfide is 1,000 µg/L assuming a Carcinogenic Total Risk (TR) of 1x10E-6 [USEPA Regional Screening Level (RSL) Tapwater Supporting Table, May 2010]; the RSL for carbon disulfide would therefore be 10,000 µg/L assuming an excess cancer risk of 1x10E-5. Consistent with the approach used on other sites for the application of screening levels, it is appropriate, therefore, in the absence of a MCL, to consider an RSL Tapwater of 10,000 µg/L for carbon disulfide when evaluating groundwater data for the Site.

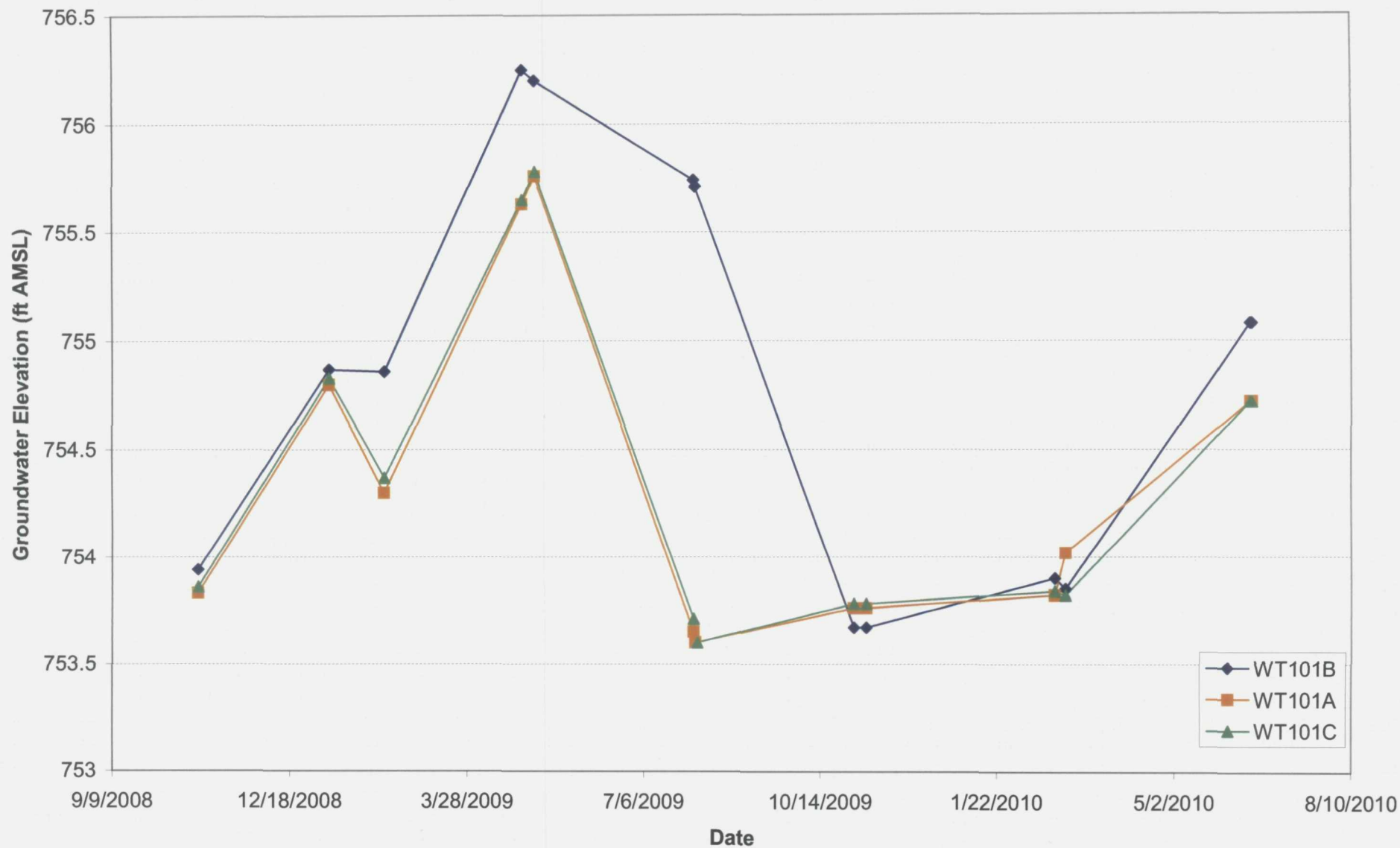


figure 1

HYDROGRAPH-WT101
HIMCO SITE
Elkhart, Indiana



Amis Annual GW monitoring Report 7/22/10

- Purpose = present results of routine GW monitoring @ Amis (2008-2010)
- GW elevation & VOC/organics monitoring
GW sampling - baseline = 10/08
Q2 = 2/09, Q3 = 4/09, Q4 = 8/09, Q5 = 11/09
Q6 = 2/10

Goal → Characterize nature & extent of
GW contamination beneath site

Background = WT102, WT112,

Sample locations = WT101-4, WT103, WT116, WT113,
WT.E1-3, WT115, WT101,
WT114, WT113

Sentry wells = WT117, WT118, WT119,
WT125

Note: No plume map

Approval of Himco Annual Groundwater Monitoring Report (as revised 11/4/10)

ROSAURO DELROSARIO to: gary.toczylowski

01/31/2011 04:50 PM

Cc: dpetroff, kevin.m.howe, dquigley

Gary,

Denise correctly reminded me that EPA already sent in comments on the annual gw report pertaining to the above on 9/28/10 and CRA prepared a response on 11/4/10. I've reviewed the latest responses, pertaining to additional plume maps for organics and setting acceptable (10-5) risk-based cleanup levels for contaminants that don't have MCLs, specifically for 1,1 DCA and carbon disulfide. After looking over the response contained in Bayer's 11/4/10 response, it appears all of EPA's remaining comments have been satisfactorily addressed. Based on this finding, EPA finds the report, as revised, as acceptable and, consequently, approved. Please accept this email as this office's formal determination on the subject document.

Sincerely,

Ross del Rosario

Ross del Rosario
RPM



**CONESTOGA-ROVERS
& ASSOCIATES**

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July 22, 2010

Reference No. 039611

Mr. Rosauero del Rosario
EPA Project Manager/Coordinator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Dear Mr. del Rosario:

Re: Annual Groundwater Monitoring Report
Himco Site, Elkhart, Indiana (Site)

Please find attached the Annual Groundwater Monitoring Report for the Himco Site. Conestoga-Rovers & Associates (CRA) has prepared this submittal on behalf of the Himco Site Trust (Trust) for your review and approval.

Should you have any questions, please call me at (519) 884-0510.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Denise Gay Quigley

Alan J. Deal, M.Sc.

DQ/cb/24
Encl.

cc: Doug Petroff, IDEM (2 copies)
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Tom Lenz, Bayer HealthCare
Alan Van Norman, CRA (electronic)